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A
PRACTICAL GUIDE
TO
OPERATIONS
ON THE
TEETH.

TO WHICH IS PREFIXED
A HISTORICAL SKETCH OF THE RISE AND PROGRESS
OF DENTAL SURGERY.

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ANATOMY AND DISEASES OF THE TEETH, AUTHOR OF
OBSERVATIONS ON OBTURATEURS,
&c. &c. &c.

PHILADELPHIA,
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1832.

J. O. Hill

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PREFACE.

FROM the numberless treatises on Dental Surgery already existing, it might appear to be a work of supererogation to offer another to the notice of the medical public, more especially as the title page of each work usually promises every thing that the most anxious student can desire. Unfortunately, however, the work itself but too frequently falsifies the professions by which it is introduced. Much is proposed, but little performed; and after the author has very liberally abused all other professors, and confidently announced that he alone is the man and that "wisdom will die with him," the reader finds an intimation at the end of each

chapter that if he wishes to know the author's method, he must go to his residence (as a patient) where he will be enlightened in all the mysteries of the art. In fact with the exception of Mr. Bell's admirable work, the books which have been published for some years past, have been only literary advertisements to the public in general, to whom they have been most commonly addressed; full of nothing but assertions of the skill and knowledge of the writer, illustrated by cases suitably prepared to gain them credence. It is not uncommon for students and practitioners anxious to obtain practical information founded on experience, to procure one or perhaps several of these popular works, and after reading them, to discontinue the pursuit in disgust, and assert, with some appearance of truth, that dentists are in general little better than charlatans. The subject is indeed very generally neglected by medical students, a circumstance much to be lamented. Every hospital should have attached to it a professor of

the dental art. If this were the case, the poor would escape many extensive fractures of the alveolus, fractured teeth, and other accidents which they now meet with. This class of practice is considered too unimportant for the attention of the higher surgeons, and it consequently falls into the hands of the pupils under whom many accidents are constantly occurring.

The very small portion of information to be found in any previous work on the operative part of the profession, and the imperfect description of the necessary instruments proper, has induced a belief that a practical work on the art was still a *desideratum*. It was presumed that such a work would be useful as well to students and medical practitioners as to those dentists whose education has been limited. Such, it is notorious, are the greater number now in practice. That they may have their errors corrected, and their instruments improved, is the wish of the author; and in seeking to advance these ends, he is conscious that he is endeavouring to diminish the amount

of human suffering and to promote the well-being of mankind.

As no author has hitherto given any historical account of the rise and progress of the art, a slight sketch is prefixed to this work. It has long been the intention of the author to write a work wholly on this subject, as there is an abundance of useful and interesting materials to be found for the purpose; but the fear that such a work would not be generally acceptable—at any rate not so useful by itself, as in combination with matter of a practical nature—has induced the author to suspend for the present the full execution of his original intention, and confine himself to the brief sketch now presented to the public.

The author trusts the profession will do him the justice to admit that his object is to give information founded on practice, and that while he fears not to expose empiricism, he is at the same time anxious to treat with respect the honest and well considered opinions of others, though they may differ from his own.

He has given Mr. Weiss in the Strand the patterns of all his instruments; but enthusiastically desirous of diffusing information and improvement, he takes this opportunity of saying, that it will at all times give him pleasure to show to any respectable member of the profession, the whole of his apparatus. He feels, and he wishes to impress that feeling on his professional brethren, that it is by liberal conduct alone that either the art or the artists can become respectable: Mystery and empiricism will degrade both the one and the other. How far the object of the author has been attained in the present work, he must leave to the judgment of others. Practical utility has been his aim; and if his work possess this recommendation in any degree, he has not laboured in vain.

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INTRODUCTION.

It is idle to inquire with whom, or in what country, medicine took its rise. The origin of science of every kind is not sudden and palpable, but slow and insensible; and such was perhaps more particularly the case with that of medicine. The practice of sacrificing animals, in honour of the Supreme Being, which has prevailed from the remotest periods, and that of employing them as food, which is coëval with it, must have imparted, from the first, some knowledge of the anatomy and physiology at least, of the inferior animals to man; and the destructive private combats and public wars, in which men have been from time immemorial engaged, would soon add to this knowledge some insight into

the anatomy and physiology of the human species. At a somewhat later period, the promulgation, by the ancient Egyptians, of the doctrine of metempsychosis, or transmigration of the soul, and the consequent invention of the art of embalming, probably added still further to man's knowledge of the structure and functions of the human frame; and with this knowledge, that of diseases, and of their remedies, has always to a greater or less degree kept pace. It is, however, in the writings of Moses, who flourished about 1500 years before the christian era, that we find the first mention made of physicians. It is said, indeed, that in the books of the Confucius of the Chinese, the Zoroaster of the Persians, the Brahma of the Hindoos, and the Tot, or Hermes Trismegistus of the Egyptians, are severally contained distinct treaties on the subject of medicine; but every thing relating to these personages and their works, is involved in almost impenetrable darkness. The physicians, however, mentioned by Moses,* seem to have been confined to Egypt, the Israelites, after their departure out of this country, having, apparently, always employed

* Gen. Ch. L. v. 2.

their priests in that capacity; and the same practice seems to have prevailed, at that period, among the Greeks, the first physicians of whom were Melampus and Orpheus, who were, at once, physicians, priests, and poets. About 250 years subsequent to this period, that is to say, about the time of the siege of Troy, the only medical men were heroes, and most of them, as Telamon, Teucer, and Achilles, are known, almost exclusively, in the latter character, their skill in medicine having been very generally forgotten, in their renown as princes and as warriors; while some few, as Chiron, Æsculapius, Machaon and Podalirius, are seldom thought of otherwise than as medical men, their reputation as princes and warriors, as they all were, falling far short of that which they enjoyed in medicine. It is proper to keep in mind, however, that they were all surgeons only, and not physicians; the word *Ιατρος* absurdly translated physician, being derived, according to Sextus Empiricus from *Ιος*, a dart, because a chief part of their skill consisted in being able to extract darts with dexterity. Of their surgeons, by far the most celebrated in those times, was Æsculapius, a pupil of Chiron, and a prince

Asclepiades III about time of
Sage of Troy - 1st recorded extrac-
tion of a tooth 4

of Thessaly, the inventor, according to Cicero,*
of the probe, and the first man to bind up a
wound; but it was reserved for the third sur-
geon of that name, according to the same author,
to venture, for the first time, upon the more
important step of drawing a tooth. What the
particular kind of instrument was, which he
employed in this operation, or how he used it,
we are not informed; but we learn from Cælius
Aurelianus, that many years afterwards a leaden
extractor was exhibited at Delphi, as a hint that
no great force was to be employed in the removal
of the teeth. "Erasistratus," says he, "plum
"beum inquit od-outagagum, quodnos denti-
"ducum dicere poterimus, apud Delphum, in
"Apollinis templo, ostentationes, causâ proposi-
"tum, quo demonstratur oportere eos dentes
"auferri, qui sint faciles, vel mobilitate laxati,
"vel quibus sufficiat plumbei ferramenti cona-
"men ad summum."† I am not aware that any
operation upon the teeth is ever alluded to by
Homer, minute as were his descriptions of most
of the surgical processes employed in his time,
so that we may conclude that their extraction

* De Nat. Deorum, Lib. III. ch. 22.

† Morb. Chorn. Lib. II. ch. 4.

Done - probably 750 to 900 B.C.

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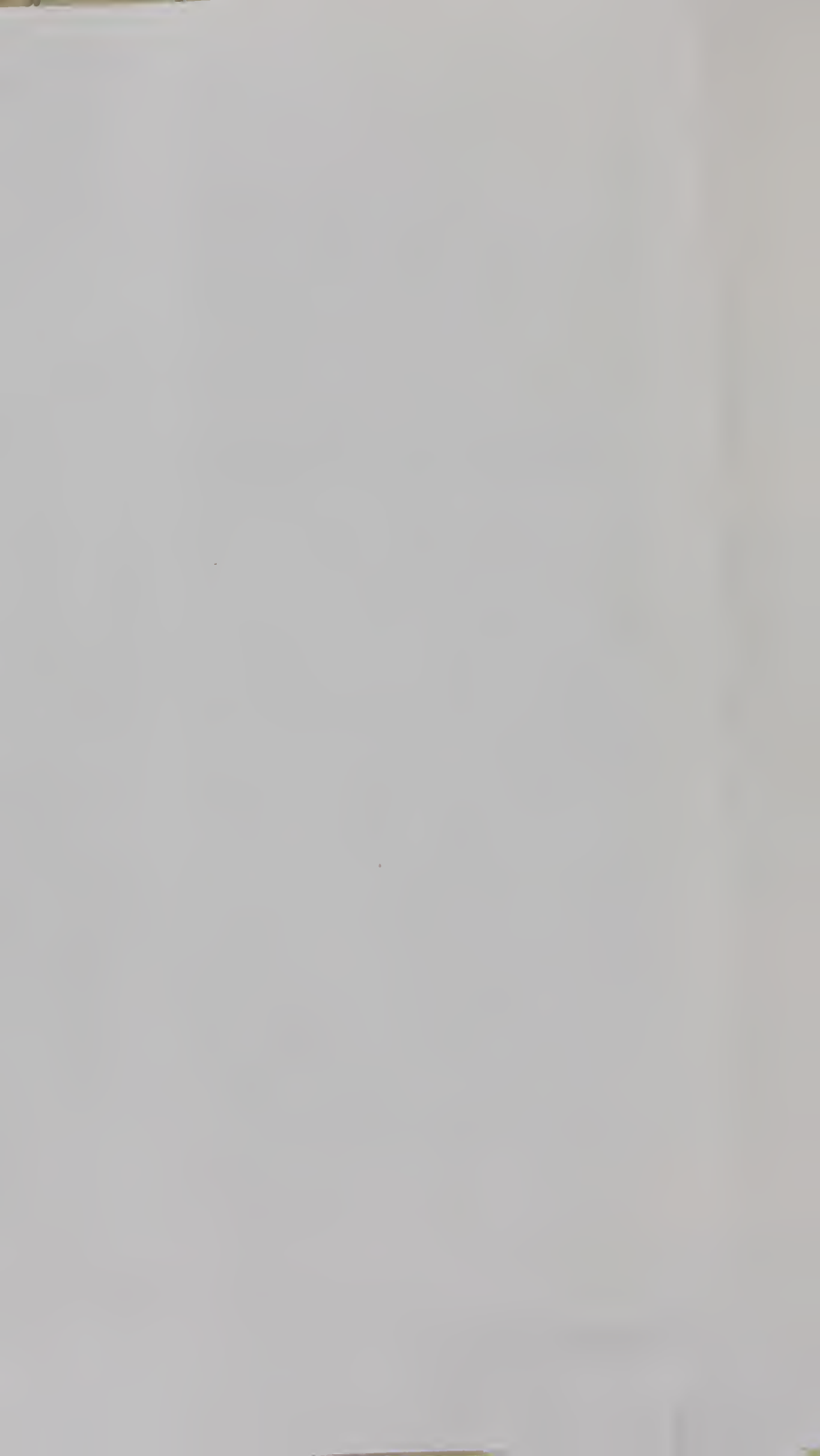
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was very rarely, if ever then practised; and this is the less remarkable, as he certainly never mentions blood-letting, although this operation is said, by Stephen of Byzantium, to have originated with Podalirius.

It was during the time that Homer flourished in Greece, or about 850 years before the Christian era, that the Pastophori were promulgating their doctrines in Egypt, and it was from these doctrines that the first regular art of medicine, as afterwards propagated by the philosophers and physicians of Greece, took its rise. Of the bible of Egypt, the reputed production of Tot or Hermes already mentioned, one portion, it is said about one-seventh, was devoted to medicine, and divided into six chapters, the 1st treating of anatomy, the 2nd, of diseases, the 3d, of instruments, the 4th, of materia medica and pharmacy, the 5th, of diseases of the eyes, and the 6th, of those of women. To the study of these scriptures, one detachment of the priesthood of Egypt, called by the Greeks, Pastophori, was especially devoted; and these men became, of course, the only regular professors of the art of medicine, in a country, at that time, unquestionably the most cultivated in the world,

although it appears from Homer, that almost every man here, was more or less skilled in medicine.

Ἰντρός δὲ ἐησας ἑπισαμενος περὶ παντων Ἀνθρώπων.*

It must not be supposed, however, that any one man exercised, in his own proper person, all the several departments of this science. In no country whatever was the division of labour better understood than in ancient Egypt, and in no profession was it more displayed than in medicine: it was here, accordingly, that the dental art, as a distinct branch of the profession, had its origin. It is stated by Herodotus, the first Grecian historian, "The art of medicine "is so practised in Egypt, that there is found an "individual healer for each individual distemper. "Hence the whole country is filled with healers, "Some take charge of the disorder of the eyes, "others of those of the head, *others of those of* "the teeth, others of those of the belly, and others "of secret diseases."† Now, as these several offices were hereditary, it might have been presumed a priori, that the professor of them would,

* Odys. Lib. II. v. 31.

† Lib. II. v. 84.

In the time of Homer - medicine
became specialized. + Dentistry was
one of the branches of medicine
+ Surgery.

in the time of
Homer -

850 B.C.

The Egyptians
were skilled
in
medicine.

Dentistry

was - a
part of
medicine

CEN

POTATO

PARAGUS

CHEESE

in process of time, attain great perfection, each in his own branch; and accordingly the skill of the medical men of Egypt, was long the wonder and admiration of the world; and the monarchs of Persia, and other countries, for many ages employed Egyptians alone as their physicians and surgeons, till the superior surgery of the Greek school at length supplanted them. In no branch of the profession, however, was the ancient Pastophorus so famous, as in his treatment of the diseases of the eyes; and the present of an Egyptian oculist, was long considered a fit offering from one sovereign to another. This may perhaps be accounted for, from the liability of the people of this country to violent disorders of the eyes, and the extensive practice which their medical men would enjoy in the treatment of them; and probably the general silence of authors, respecting their proficiency as dentists, may be, in a similar manner, explained from the reputed immunity of the inhabitants of Egypt, from disorders of these organs, it having been noticed, that a carious tooth is very rarely found in the head of an ancient mummy.

At the college of Memphis, in Egypt, was

*the early history of dentistry in
making - for before for the first time
of the Egyptians.*

educated the Grecian philosopher Thales, and at that of Thebes, Pythagoras; and the subsequent establishment by them, of schools of philosophy and medicine in Europe, by the former about 780, and by the latter about 580 years before the christian era, forms a most important epoch in the history of the latter science. During the period which intervened between the time of Homer and those of Thales and Pythagoras, both the science and the art of medicine were in a very degraded state in Greece. For a considerable time, the profession was principally in the hands of the priests of Apollo in general; but most of these having in time declined medical practice, in favour of oracle-delivering, the few who still adhered to it, set up a kind of opposition god, in the person, or rather in the name of Æsculapius; who was, from this time, represented as the son of Apollo, and had accordingly numerous temples, two of the principal of those at Cos and Cnidus, to which the sick used to resort, to be dealt with as it pleased the priests aforesaid. Now, as Æsculapius was the reputed son of Apollo, so his priests were all the reputed descendants of Æsculapius, and called themselves accord-

✓ Hippocrates 460 B.C.
✓ 1st real Physician
9

ingly, Asclepiades; and it was to the sixteenth generation of that branch of that family, which was established at Cos, that the renowned Hippocrates owed his existence, about 460 years before the christian era. Gifted by nature with every requisite of the most accomplished physician, he was, from his infancy, initiated in all that was then known in his own country, of medical practice; and having subsequently studied philosophy under Heraclitus the Pythagorean, he was thus qualified to engraft whatever seemed valuable, in the Egyptian system of physics, upon his previously acquired knowledge. Hippocrates was accordingly the first good observer, and the first good practical physician whom the world ever saw; and furnished in philosophy, one of the first examples of that analytical method of cultivating science, which is commonly considered proper to modern times, and of which certainly ancient times furnish but very few instances. One of his practices, in pursuit of the study of anatomy, was to visit frequently, the burying-grounds of the cities in which he resided; and his description, therefore, of the bones and teeth, are not only the best which had hitherto appeared, but

3

460 B.C.

Hippocrates was 1st real good
practical Physician.
He described the teeth

the best part of his anatomical writings. He describes, in various parts of his works, as well the functions and period of appearance of the several teeth,* as their principal diseases,† and the plan of treating them, both by manual operations and by dentifrices. “Quod ad “dentium dolores attinet,” he observes, “si “corrosus fuerit dens, et movetur, eximatur;‡” but we have no particular directions with respect to the plan of operating, nor indeed does any such appear to have been necessary, since the operation was undertaken only when the teeth were loose. In other cases, he applied to them the actual cautery;|| the use of which, in this way, seems to have been mentioned first by Hippocrates, although the practice was probably borrowed from the Egyptians, whose fondness for this remedy, in the form of heated iron, moxa, &c., is sufficiently well known. It is in the works of Hippocrates also, that we find the first mention of the plan of fixing the teeth with gold wire; although this practice also seems to have been prevalent before his time,

* De Carnibus.

† De affectionibus, S. 1. Coacæ Præstationis, S. 1. &c.

‡ Ibid.

|| Ibid.

*Moving loose teeth
or for fracture of the jaw bones.*

since there are said to have been found, in a tomb, together with several Greek vases, seven teeth united together. He speaks of this practice only, or chiefly however, in cases of fractures of the jaws; in which case he observes, "Si dis-
 "torti fuerint dentes, juxta vulnus commoti,
 "postquam os directum fuerit, dentes inter se
 "conjungere oportet, non duos solùm, sed etiam
 "plures, atque hoc maximè auro sin minùs, lineo
 "filo, donec os corroboretur."* Among the dentifrices of Hippocrates, some of which were recommended for the purpose of fixing the teeth, and seem therefore to have suggested, for the first time, the idea of cements, we found, among a few sufficiently good ones, some of a very whimsical character, for example, the head of a hare, and three entire mice (from two of which the entrails were to be removed) burnt and reduced to powder, and subsequently mixed with an equal weight of powdered marble.† But whatever were the frivolities of Hippocrates, it is unquestionable, that the medical profession owes more to him than to any other individual of either ancient or modern times; and that, as

* De Articulis, S. 6.

† De Morb. Mul. S. 3.

Charcoal + marble dust - (Jamine)

his few imperfections were those of the age in which he lived, so his great and manifold excellencies were all his own.

Cotemporary with Hippocrates, and of almost exactly the same age, was Plato, who received a part of his education at the school of Helio-
polis, in Egypt, and was further a pupil of So-
crates; and a favourite pupil of Plato was the
still more celebrated Aristotle, the preceptor of
Alexander the Great, and the founder of the
Peripatetic School of Philosophy, as Plato was
of the academic. With the particular opinions
of these philosophers, or those of Chrysippus,
who flourished somewhat later than Aristotle,
and was the founder of the Stoic School, we
have very little to do at present, although, as
they exerted an important influence on the
medical doctrines and practice, not only of
their own times, but of so many subsequent
ages, it would be unpardonable to omit their
names. A pupil of Chrysippus was Erasistratus,
and a pupil of Praxagoras (a descendant,
at some few removes, from Hippocrates) was
Herophilus, both of whom flourished about 300
years before Christ, and are memorable for the
great reputation which they acquired for Alex-

andria, as a school of medicine. They are the first systematic dissectors on record, of the human body; and they certainly conducted their business in the wholesale way, if we are to believe historians, that the latter alone, in his time, dissected no fewer than seven hundred subjects: nay, it is asserted by Celsus, and others, that they were allowed by the Ptolemies, under whose patronage they lived, the use of condemned criminals, on whom, while still living, they conducted their investigations! The progress of anatomy and physiology in this school, was very considerable; but that of medical practice can hardly be said to have kept pace with it; the remedies employed by Erasistratus, in particular, having been, for the most part, very inert. He was a decided opponent of blood-letting, vomiting, purging, and most other measures, on which medical men have at all times principally relied, in their treatment of acute affections, and his surgery was almost as insignificant as his medicine. It is Erasistratus, as I before observed, who speaks of the leaden forceps, at one time displayed in the temple of Apollo, in order to deter practitioners from using any force in extracting the

teeth; and Herophilus, as well as Heraclides, of Tarentum, are said to have gravely related several cases of persons who had died from this operation.*

For many years previous to the time of Erasistratus and Herophilus, Rome had been rapidly rising in importance, but it was in arms, not in philosophy. In this respect the Romans may be said to have been, from first to last, a race of savages. For more than 500 years after the foundation of Rome, not a medical man, by profession, resided within her walls; and the first who did so, Arcathagus, a Grecian, although on his arrival, dignified with the title of *Vulnerarius*, or healer of wounds, and allowed to keep a shop, was soon after stigmatized with the name of executioner, from the abhorrence entertained of his knife and cautery, and ultimately banished from the city. The legitimate exercise of medicine was subsequently decried with stupid ferocity, by Cato the censor, who laboured to establish, in its stead, the most puerile and idle practices, founded on the blindest credulity and superstition; nor was it till more than 200 years after the time of

* Cœlius Morb. Chron. Lib, II. c. 4

Erasistratus and Herophilus, that a medical man attempted, for the second time, to establish himself at Rome. This occurred in the person of Asclepiades, the Bythinian, the friend of Cicero, and the founder of the methodic sect of physicians; cotemporary with whom was Dioscorides, the Cilician, the physician of Cleopatra, in whose works may be found an account of a considerable number of dentifrices, the mention of which, however, need not detain us here. It was soon after this period, that the use of wine, as a dentifrice, was alluded to, as a sufficiently common practice, by the poet Catullus,

“ Quod quisque minxit, hoc solet sibi mane,

“ Dentem atque russam defricare gingivam ;*

and it was, a few years afterwards, further insisted on by Arabo, the Geographer, and Diosdorus, the historian.

About the commencement of the christian era flourished at Rome, the celebrated Cornelius Celsus, deservedly called the Latin Hippocrates, not only because his work on medicine is in a great measure, an epitome of those of the Father of Medicine, but because it contains almost

* Epig. 33, in Egnatium.

every thing known respecting the practice of the art, at the time it was compiled. It is in Celsus, that we meet with, for the first time, any thing like explicit directions with regard to the extraction of the teeth. "Si verò," says he, "dens doloret movet eximique eum, quia
"medicamenta nihil adjuvant, placuit, *circum-*
"*radi debet*, ut gingiva ab eo resolvatur, tum is
"*concutiendus est*: eaque facienda donec bene
"moveatur. Nam dens hærens cum summo pe-
"riculo evellitur, ac nonumquam maxilla loco
"movetur. Idque etiam majori periculo in
"superioribus dentibus fit; quia potest tempora
"oculosque concutere. Tum, si fieri potest
"manu, si minus, forfice dens excipiendus est:
"ac, si exesus est, ante id foramen *vel lina-*
"*mento, vel bene accommodato plumbo replen-*
"*dum est*, ne sub forfice confringatur. Recta
"verò forfex ducenda est, ne inflexis radicibus
"os rarum, cui dens inhæret, parte aliquâ fran-
"gatur. Neque ideo nullum ejus rei periculum
"est; utique in dentibus brevioribus, qui fere
"longiores radices habent: sæpe enim forfex
"cum dentem comprehendere non possit, aut
"frustra comprehendat, os gingivæ prehendit et
"frangit. Protinus autem, ubi plus sanguinis

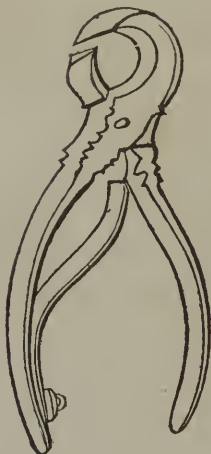
1st forceps - described - called
Vulsella 17

"profluit, scire licet aliquid ex osse fractum
"esse. Ergo specillo conquirenda est testa, quæ
"recepit, et *vulsella* protrahenda est: si non
"sequitur, incidi gingiva debet, donec labans
"ossis testa recipiatur," &c.* In this paragraph,
to say nothing of the attempt made to supersede
the necessity of a natural loosening of the teeth,
by well shaking them before proceeding to
extraction, besides the names of the instru-
ments employed, and sufficiently full directions
in other respects, we find mention made, for
almost the first time, of scarifying the gums,
and of stopping carious teeth with lead, and
other substances; though the latter practice
seems to have been hitherto resorted to only for
the purpose of preventing their breaking, during
the operation of extracting them. The *vulsella*,
mentioned above, is said by Scultetus, to have
been a kind of forceps; the pincers of which
were, in appearance, like the bill of a parrot,
and toothed, so as to take a firmer hold. It
will be found to represent, or nearly so, the
instrument recommended in the present day,
and denominated hawk's-bill forceps, a name

* Lib. VII. c. 12.

Colles - ⁴ beginning Christian Era
first describes method & instru-
ments for Extracting Teeth & also
insists upon loosening the Teeth
before trying to remove,

which has been given to it at different times by various writers. (1). In cases in



which the root of the tooth, after the extraction of its body, was left behind, Celsus recommends its removal by a particular instrument, called by the Greeks, "*Πισαυρα*." He was not, however, any more than the rest of the ancients, very fond of drawing the teeth; and accordingly recommends in its stead, the application sometimes of the actual cautery, or of hot oil, and sometimes of numerous caustic medicines, the intended effect of which was to make the teeth exfoliate.* The practice also mentioned by Hippocrates, of fixing the teeth with

* Lib. vi. c. 9.

gold wire, is again alluded to by Celsus, and this not only in cases of fracture of the jaw, but “*si ex ictu vel alio casu aliqui labant;*” and he recommends an infinite number of dentifrices and washes,* many of which were for the purpose of fixing teeth which had become loose, by constricting the gums. It seems however, that the plan of fixing the teeth with gold wire, was not an uncommon one in ancient Rome, since it is alluded to in the twelve tables of the Roman laws; although Funke, in his illustrations of those tables, does not admit of this explanation of the expression, “*Cui auro dentes vincti sunt,*” from believing it to be impossible to fix them in this manner.† Another practice mentioned by Celsus, is that of scraping the teeth; “*Dens autem scaber,*” says he, “*qua parte niger est, radendus est;*” and this appears to be one of the first notices of a remedy which subsequently became so common.

Some years after Celsus, lived Scribonius Largus, and Marcellus, both of whom have left behind them some very curious recipes for whitening and fixing the teeth. Among others,

* Lib. vii. c. 12.

† Leges Duodecim Tab. Illustratæ a I. N. Funcie.

one which was used for this purpose by Octavia, and another by Messalina. A chief ingredient of many of these, however, as well as that of Hippocrates, already mentioned, and of not a few of those still in use, was charcoal; for, of whatever ingredients the recipe, they generally finished by ordering them to be well burnt, which must have reduced them all to nearly the same thing. Marcellus was no friend, even in tooth-ache, to extracting the teeth, which, he says, "*plurimi dicunt remedium esse optimum;*" but recommends rather cauterizing them with boiling oil, or caustic substances, fomenting them with hyoscyamus or opium, stopping them, if carious, with gum, or other similar substances, or lastly, scooping out the decayed part with a common scalpel, which may be done, he says, "*sine ullo dolore, et reliqua*" "*solida pars et speciem et usum dentis præstabit.*"* From the poet Martial, who flourished between the respective periods of the two last mentioned authors, we learn, that fixing teeth was by this time, as regular a branch of the Roman dentists' profession, as extracting them. "*Eximit aut reficit dentem Cascellius*

* De Medicamentis, Cap. XII.

“ægrum;”* though we have no very distinct description of the manner in which it was usually effected. It is in the same author, likewise, that we meet with the first habitual allusion to false teeth, the invention of which, according to him, preceded that of false eyes;† as we might indeed have supposed, from the well-known fact, that such teeth are, in the present day, in great request among many savage tribes, to whom the use of false eyes is unknown. In these cases, if we are to believe Bontius,‡ teeth of gold are frequently substituted for the natural ones; but the ancient Romans appear to have been satisfied with such as best imitated the latter; and accordingly employed chiefly bone or ivory, in their manufacture. Of this description, Martial says, were the artificial teeth of the numerous Roman ladies, whom he mentions, as resorting to this means of increasing their personal attractions

Sic dentata sibi videtur, Œgle,
Emptis ossibus, Indicoque cornu.¶

* Lib. ix. Ep. 56.

† Lib. xii. Ep. 23.

‡ De Medicina Indorum.

¶ Lib. xii. Ep. 73.

Thais habet nigros niveos Lecania dentes.

Quæ est ratio? Emptos hæc habet illa suos.

*Dentibus atque comis, nec te pudet, uteris emptis, &c. **

We come now to an era in the history of medicine, which ranks next to that of Hippocrates : I mean the era of Claudius Galen. About the time of his appearance, the profession was split into all kinds of sects, the methodic, pneumatic, empiric, episynthetic, eclectic, and innumerable others ; but Galen appeared, and all these hid their diminished heads, like the stars at sun-rise. He was born at Pergamus, about 130 years after the christian era ; and studied philosophy and medicine successively at Smyrna, Corinth, and Alexandria. At the age of 34 he settled at Rome, and remained there, with only temporary visits to other places, till his death. Galen was, obviously, a man of wonderful acuteness, and indefatigable industry, and left behind him a pile of medical writings, of frightful extent, the influence of which, on the subsequent theory and practice of the art, was more arbitrary, and of longer duration, than that of any other compilation, before or

* Lib. xii. Ep. 23.

*Galen - somewhat a braggart
but probably had some reason for
it?*

23

since his time. "I have," says he, speaking of himself, with more truth than modesty, "done
" as much for medicine, as Trajan did for the
" Roman empire, in making bridges and roads
" through Italy. It is I alone, who have
" pointed out the true method of treating dis-
" eases. It must be confessed, that Hippocrates
" had already chalked out the same road; but,
" as the first discoverer, he has not gone so
" far as we could wish. His writings are
" defective in order, in the necessary distinc-
" tions. He opened the road—another rendered
" it passable." Like Hippocrates, Galen cultivated science, not only in the synthetical, but in the analytical method; and is undeserving of the reproach with which he has frequently, in modern times been loaded, of having contributed with Aristotle, to impede the true spirit of philosophical investigation. If the proper manner of prosecuting science be by cautious induction, from careful experiment, no man ever prosecuted it more legitimately, or more successfully than he. His whole work, *De Anatomicis Administrationibus*, is full of such experiments and such inductions; and the name of Galen is undervalued only by those who

are unacquainted with his writings, and who find it much easier to sneer than to study. With respect to that branch of medicine, however, with which alone we have any immediate concern, but very little additional information is to be derived from Galen. He describes the practice of extracting the teeth nearly in the same way as preceding authors,* and has the usual complement of dentifrices, washes, &c. with the usual reputed qualities: but his remarks on any of these subjects, are not such as to require particular notice. The surgery of Galen is indeed, less entitled to praise, than almost any other portion of his writings.

Subsequently to Galen lived Serenus, and about the same time, probably, Cœlius Aurelianus. Of these, the former recommends, in verse, almost all the same substances, as dentifrices, lotions, and means of plugging up carious teeth, which had been long before advised in prose by Scribonius, Marcellus, and others; particularly in the last capacity, the ashes of burnt mouse's dung, and those of burnt earth-

* De Com. Med. Lib. v, c, 9. &c.

worms,* both which seem, for a long time, to have enjoyed an extraordinary reputation. In Cœlius Aurelianus, we meet with the same objections to extraction of the teeth that we find in so many other ancient authors; and it is in his works, as already mentioned, that we meet with the story of the leaden extractor, exhibited at Delphi, and of the occasional fatality of this operation. Instead of extraction, he recommends in tooth-ache, a long routine of remedies to be tried, in methodical succession; "sicut enim," he observes, "alias quoque partes, in tumore constitutas, non detractio, sed mitigatione curamus, sic etiam dentes curandos accipimus."† Among the remedies is mentioned, scarification of the gums, to which, by this time, a certain instrument, called by him περιχαράκτης, seems to have been appropriated; and notice is taken also by Cœlius, of the practice of plugging the teeth with iron plummets, which he calls Ferrei Altheres, a practice to which he is decidedly hostile.

For many centuries after the time of Galen, the progress of medical science was retro-

* De Medicina Præcepta.

† Morb. Chron. Lib. 11. c. 4.

grade, the decline and division of the Roman empire, which happened about 400 years after Christ, having entailed upon science and literature such discouragement as was incompatible with their successful cultivation, and its subsequent subversion, having almost entirely annihilated them. The only writers, from the time of Galen to that of the supremacy of the Arabians, who are worthy of any notice, are Oribasius, Aëtius, Alexander of Tralles, and Paul of Ægina; the first of whom flourished about 360, the two next about 540, and the last about 640 years after the christian era. The great work of Oribasius, called the Abridgment of Medicine, is little else but an epitome of some parts of Galen, more especially of his anatomy; his remedies for diseases of the teeth, are for the most part frivolous and absurd.* That of Aëtius is considerably more full on diseases, and their treatment; but his recipes for affections of the teeth are for the most part, not much better than those of Oribasius. Like the latter, he recommends a great variety of substances calculated to supersede the use of instru-

* De Loc. Affect. Cur. Lib. iv. c. 57, &c.

ments, in extracting the teeth ; and advises, that when carious, they should be plugged with galbanum or wax.* He speaks of filing the teeth in cases in which they project preternaturally, as if he were the inventor of this operation. "Visum est mihi," he says, "eos limâ atterendos "esse ;" and he afterwards goes on to describe a kind of file which he had invented for the purpose, with a blunt head, in the form of a kernel, and made as smooth as possible, as well as to enforce the care requisite during the operation, to avoid wounding the gums, or loosening the teeth. His words are, "Sit autem caput ipsius "limæ obtusum, formæ nuclei, et quam læ-
 "vissimum. Etenim aliquando quidem in-
 "quales quædam dentium eminentiæ apparent,
 "in quibus partes tantùm aliquas lima atterere
 "opus est : aliquando autem æquali planitie ex-
 "tremitates prominent ; quare æquali etiam ac
 "plana per limam attritione indigent. Oportet
 "autem molle quoddam linteolum gingivis
 "ipsis, usque ad dentium radicem, adhibere ;
 "deinde leniter sinistræ manus digitis appre-
 "hendere, cauteque et citra offensionem lima
 "affricare, ne dum limam tolerate dens, ipse

* Contract. Med. Tet. II. Scum, 4. c. 34.

“concutiatur.”* It seems very questionable, however, whether this practice, really originated with Aëtius, and was not rather common from a very early period, having taken its rise in a natural desire to render the teeth regular. It is sufficiently well known, that the inhabitants of Java, or Congo, and other places, who are at present in a condition very similar to that of the earliest ancients, have very frequent recourse to this operation, for the purpose of promoting the beauty of their teeth ; their notions of which, however, are sometimes very extraordinary. On the score of originality, Alexander is, in general, more respectable than either of the two last mentioned authors ; but his writings contain little or nothing requiring notice in this place. A much better surgeon than any of the three, perhaps indeed the best surgeon of all antiquity, was Paul of Œgina ; but his directions, with respect to the operations upon the teeth, are nearly a counterpart of those of Celsus, with the addition of the filing process of Aëtius. “Dentem,” says he, “ad locellos usque circumscarificatum, et

* Contract. Med. Tet. II. Seum. 4. c. 30.

“forceipe paulatim concessum extrahemus. Si
 “vero corrosus fuerit, tenui linamento primum
 “cavernam explere oportet, ut ne frangatur,
 “dum ab instrumento constringitur. Quando
 “quidem et supervacui quidam dentes agnos-
 “cantur, eos quidem qui locellis insiti sunt
 “per scalpra excidemus, qui vero locellis in-
 “siti non sunt, eos per forcipem extrahemus.
 “Si vero dens aliquis supra modum auctus sit,
 “aut etiam defractus, prominentem aut super-
 “partem ipsius lima deterimus.”*

Towards the middle of the seventh cen-
 tury, the few remains of learning which were
 still left, were almost extinguished by the bar-
 barous and bigotted Saracens, who in 640 made
 themselves masters of Alexandria, which had
 continued, for nearly a thousand years, the
 greatest school for learning, and contained at
 this time the most valuable library in the world.
 This the savage disciples of the ignorant Maho-
 met entirely destroyed, assigning, as their rea-
 son, that if the books contained only what was
 in the Koran, they were useless, and if more
 than that, they were pernicious; and we may

* De Re Medica. Lib. vi. c. 28.

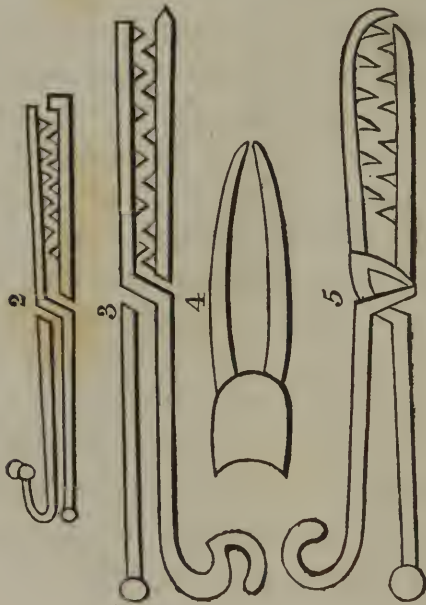
*The destruction of the Library
 of Alexandria, 1000 years in form
 ation, probably put the world back
 many centuries in knowledge*

form some idea of the extent of this destruction, when we learn that the books so condemned were sufficient to furnish with fuel, for more than six months, no fewer than four thousand hot baths. The Saracens, however, were not destined to continue savages for ever. Their califs were soon made sensible of the advantages of science and learning, and began, about one hundred years after the destruction of the Alexandrian library, to give large premiums for the translation into Syriac and Arabic of such Greek writers as they could procure; and Bagdad, Couffa, Bassora, and Damascus, at length became the resort of the learned of all nations. Such were the circumstances which gave rise to the appearance, on the theatre of medicine, of Rhases, of Hally Abbas, of Serapion, of Avicenna—the prince of the physicians, and of Albucanus—the prince of the surgeons of their times; all of whom flourished between the beginning of the eighth and the beginning of the eleventh centuries. The works of these authors are, however, very little more than translations of those of Hippocrates, Aristotle, and Galen, accompanied sometimes by meagre and absurd commentaries. With

respect to their surgery, in particular, the Arabians were scarcely on a par with their predecessors, and certainly did not surpass them; nor was it possible that they should do so, since their religious tenets, which expressly forbade the handling of dead bodies, completely debarred them from the only effectual means of attaining a knowledge of anatomy, and their other prejudices, which held the profession of a surgeon in contempt, had consigned all surgical operations to the hands of the menial servants of the physician.

From this general reproach, however, of Arabian surgery, that of Albucasis, whose principal work was written with the express design of rescuing surgery from the obloquy under which it had fallen, is free; and certainly in no ancient author do we meet with so many, and such precise directions, respecting operations upon the teeth. In that of extraction, which, it appears, had in his time fallen almost entirely into the hands of the barbers, who, as he says, "*in impudentia sua, et audacia sua,*" frequently did a world of mischief, he recommends, as Celsus had done long before, first scarifying the gums

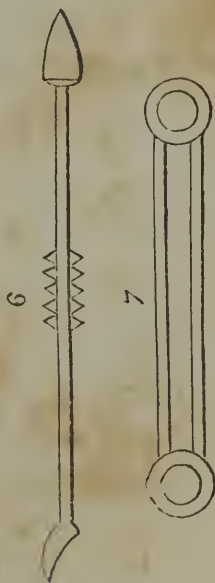
all round the affected tooth, afterwards shaking it well, and then extracting it perpendicularly, having previously, if it be hollow, stuffed it with linen; and he gives similar directions also with respect to the removal of the fragments of bone, should any portion of the socket have been unfortunately broken, and of the root of the tooth, should this unluckily have been left behind. The instrument employed by Albucasis, in shaking the teeth, was a short-handled and long-bladed forceps, (2).



and that in extracting one with a long handle and a short blade (3); and instead of the *vulsella* and *Περαρα* of Celsus, for removing fragments of the jaw, and the roots of teeth, he employed two other kinds of forceps (4 & 5), besides, in the latter cases, a great variety of levers, hooks, &c., to be varied, as he says, according to the circumstances of the case. He observes further, “that the head of the patient should be taken between the knees of the operator, in order to keep it steady; and that, if the tooth do not readily come out, a kind of lever should be inserted under it on all sides, so as to raise it a little, before again attempting its extraction.*” Albucasis also, like Celsus and others, recommends great hesitation before proceeding to extraction of the teeth; and speaks of the application of the actual cautery, or of boiling butter, as frequently a preferable measure. His directions respecting the former operation, are the following:—“*Ustio vero per ignem est, si conficias tubulum ex ære, vel tubulum ferreum; sit vero in corpore tubi aliqualis crassities, ne continuetur calor ignis ad os*

* De Chirurgia, Lib. II. c. 30 & 31.

“infirmi. Dein calēfacias cauterium, (cujus
 “forma proxime sequetur) et applies ipsi denti,
 “et retineas manum tuam donec frigescat cau-
 “terium. Hoc facias pluribus vicibus, &c.
 “Hæc vero est forma cauteriæ (6). Uras cum
 “utraq̃ue malueris extremitate, et uti conve-
 “niens tibi fuerit. Et hæc est forma tubuli
 “ejus (7). And with respect to burning with



butter, he observes—“Ustio cum butyro fit,
 “si sumatur butyrum vaccinum et ebullire
 “sinatur in cochleari ferreo, vel concha; tum
 “sumetur gossipium, et involvatur summitati

“specilli; deinde demergatur in butyrum,
 “et apponetur festinanter denti dolanti, et
 “ibi retineatur quousque refrixerit. Aliquot
 “porro vicibus id repetas, &c.”* Albucasis is
 much more full, also, than Celsus, respecting
 fixing loose teeth with gold or silver wire. Of
 this he says, “forma reticulati operis est, ut
 “filum sumas, et illud intromittas inter dentes
 “sanos et firmos; dein cum extremitatibus fili
 “duabus contexas inter dentes commotos, sive
 “unus sit, sive plures, pervenias texendo ad den-
 “tem sanum et firmum ab altero latere, deinde
 “repetas contexionem ad latus exquo contexio-
 “nem incepisti, cum lenitate et arte, donec nec
 “omnino moveantur. Et quando filum nectis,
 “ad dentium radices sit, ut non evolvatur: tum
 “abscindas duas fili extremitates superfluas cum
 “forfice, ambas colligas et invertas ambas cum
 “forcepe, et abscindas illas inter dentem sanum
 “et firmum et dentem commotum vacillantem,
 “ne linguam lædant.†” He speaks also of
 this method, as adapted to retain in their
 places teeth which have been re-inserted after
 having been removed; an operation which, it

* De Chirurgia, Lib. I. c. 21.

† De Chirurgia, Lib. II. c. 33.

has been falsely said, was unknown to the ancients.* With respect to scraping the teeth, we meet, in Albucasis, with drawings of no fewer than twelve or fourteen different instruments adapted to this purpose; some being calculated, as he says, for scraping the inside of the teeth, others the outside, and others the interstices between them :† these it is quite unnecessary to copy. He was acquainted also with the use of false teeth, and describes them as made, in his time, of bullock's bone, and as retained in their places with gold wire, like loosened or transplanted natural teeth. Lastly, he gives a description of the process of filing the teeth, which had been introduced into general use more recently than any of the others. The file, he says, should be of this form (7). "Sicut

8



"lima cum quâ acus conficiuntur. Dentem
 "autem cum illa limabis pulatim, multas per
 "dies cum lenitate ne commoveatur dens:

* Dict. des Sciences Med. Art. Dent.

† De Chirurgia, Lib. II. c. 29.

“excideret enim, tum ne alium commoveat,
“&c.”*

As the learning of the Greeks and Romans had been destroyed by the Saracens, so that of the Saracens was, soon after the period of which I have been speaking, as effectually destroyed by the Turks, (at that time more barbarous than the Saracens had ever been) who took Bagdad about the year 1250, and thus raised the Ottoman empire on the ruins of the Saracen. The occupant of Palestine by the Turks gave rise to the Crusades, and all the follies connected with those mad enterprises; but though the Christians did not recover the Holy Land, they did what was more important, in bringing back with them, much of the civilization which still distinguished the eastern nations. It was thus principally that alchemy was introduced into Europe; and not long after, the alchemists were almost the only philosophers, as the monks and friars were almost the only physicians, in this quarter of the world. The latter, indeed, having laboured

* De Chirurgia, Lib. II. c. 32.

with success to put down the Jews, who, during the latter part of the Arabian supremacy, had been not only the chief medium of communication between distant nations, and the chief depositories of literature, but the principal medical practitioners of the age became the curators of the bodies, as well as of the minds and estates of their fellow-men, being at once the physicians, divines, and lawyers of their times. Of the medical practice of either Jews or Friars, it is unnecessary at present to speak; and with respect to the surgery of this period, it appears to have been very little better than that which prevailed in Greece, soon after the time of the Trojan war; the chivalrous ages, which in so many other points were similar to the heroic periods of Grecian history, resembling them also in this, that surgery was practised principally by the heroes themselves, and their dulcineas, at least as far as appertains to the extraction of darts, and the application of salutiferous balsams to wounds. The little else that was attempted at this period, was chiefly in the hands of barbers, farriers, and swine-gelders, the first of whom were, in 1308,

incorporated, at London, into a common company with the surgeons. During many years previous to this period, colleges had been founded in various cities of Europe; but it was not before the destruction of the last remnant of the Roman Empire, and the occupation of Constantinople by the Turks, in 1450, that they attained any considerable celebrity. This event, which expelled all the learned Greeks from their native country, drove them for protection to Venice, Padua, and other adjacent states, in which they subsequently taught with success, all those arts and sciences for which their countrymen had been always celebrated; and the invention of the Art of Printing, which took place about the same time, naturally contributed to render their efforts to civilize the rest of Europe eminently successful. To these great events were added, a few years afterwards the discovery of America by Columbus, and that of a navigable passage to the East Indies, by Vasco de Gama—all conspiring to render the close of the fifteenth and the opening of the sixteenth centuries, one of the most important epochs in the history of science, and of the world.

Previously to this period, the system of anatomy in common use, in the several European Universities, were that published by Mondini, a lawyer, in 1315, and that by Benedict, a few years later, both extracted principally from what the Arabians had preserved of Galen's doctrines on that subject, and both extremely rude and servile performances; and the most celebrated surgeons of the day were equally rude and servile imitators of Albucasis and Guy de Chauliac, (the latter of whom flourished about the year 1350,) placing their chief reliance, in most cases, on plasters and ointments, and having an invincible, and no doubt well-founded, repugnance to operations of all kinds. As examples of this, it may be mentioned, that De Vigo and Sylvaticus, two of the most renowned surgeons of that period, left the operations of lithotomy to itinerant charlatans; that in the days of Lange, that of trephining was almost unknown, and that in those of Amatus, the surgeons of Ferrara were incapable even of scarifying. This state of things, however, was destined now to have an end. The colleges of Toledo, of Bologna, of Salerno, and others, founded during the supremacy of the Arabians; the university of Paris,

founded by Charlo Magno, in 792, that of Oxford, founded by Alfred, in 886, and those of Padua, Montpelier, and Salamanca, founded successively in 1179, 1169, and 1240, began now to contain men worthy of occupying the chairs of professors; and in consequence, the profession of medicine, in common with all others, began to rise rapidly into respectability and importance.

The principal teachers of anatomy and surgery, at the period of which I am now speaking, and during the whole of the sixteenth century, were Berenger, at Padua, Massa, at Venice, Vesali, at Pisa, Bologna, and other Italian towns; Ingrassias, at Palermo, Jaques Du Rois, (commonly called Jacobus Sylvius,) at Paris, Tallopi, at Pisa and Padua, Eustachi, at Rome, Aranzi, at Bologna, and Fabrice d'Aquapendente, at Padua.

It is quite unnecessary to particularize, in this place, the improvements made in anatomy by these several authors, or the numerous errors which they detected in their predecessors; but, as connected more immediately with my present subject, since it served to pave the way for the division of professors of surgery in

modern times, into oculists, aurists, dentists, and so forth, as well as general practitioners, I cannot omit to mention, that Vesale and Fallo-
pia were among the first to give any thing like a respectable description of the eye; that it was Vesale, as well as Ingrassias and Fallo-
pia, who for the first time, made any successful attempts to investigate the structure of the internal ear, and especially that it is to Fallo-
pia and Eustachi that we are indebted for the first useful or intelligible description of the *Teeth*. With respect to the progress of dentition, of which the most vague and false ideas had been previously entertained, it was particularly remarked by Fallo-
pia, that the rudiments of both sets of teeth existed in the human fœtus, forming the segments of two circles, the one anterior, and the other posterior, the former of which first made its appearance; in doing which each tooth ruptured a membranous envelope, in which it had been previously contained—
“folliculus disrumpitur, et dens nudus durus-
“que extat.”* The same fact is still further insisted upon by Eustachi, who dissected a

* Quæ in osse Frontis et Malis contenta sunt. p. 370.

great number of foetuses, in order to assure himself of it; and he details all the particulars with extraordinary care. He gives us also a much fuller and more satisfactory account than had been before offered, of the form, structure, and uses of the teeth, at every period of life.* Such discussions as these, necessarily led to a more minute consideration of the anatomy of the teeth, by medical men in general; and, in consequence, to a more diligent investigation of their diseases, and more happy suggestions respecting the method of treating them; but it was not till about twenty years after the period of these great men, that the first work, explicitly on the structure and diseases of the teeth, made its appearance. The work alluded to, was that of Urban Hèmand, surgeon of the Cardinal d'Armagnæ, published at Lyons in 1581, and containing a great deal of curious and valuable information, on the structure and form of the teeth in man; who, as he pretends, must necessarily have combined all the kinds of teeth which severally distinguish other animals, since he is destined to feed on all the kinds of aliment

* De dentibus, p. 44. &c.

first work while writing
on Dental Anatomy
— Urban Hèmand —
1581

on which the latter respectively subsist. On the diseases of the teeth, Hèmand is much more meagre and unsatisfactory; and in the true spirit of the times, seems to have relied, far too much on topical applications for their relief.

I have just mentioned that Hèmand was a surgeon, nor does it appear that the distinctive profession of a dentist had hitherto become established. Surgery, however, was in the mean time, rising rapidly and deservedly into greater estimation. The chief surgeons of this period, in addition to Berenger, Ingrassias, Fallopi and Aranzi, of whom I have already spoken, were Blondo, of Venice, Mariano, of Naples, Wury, of Bâle, Parè, of Paris, and Guillemeau, of Orleans; and the advancement which surgery in general made under their auspices was very considerable. In the treatment of injuries of the head in particular, surgical science owes as much to Berenger, as it does to Ingrassias in that of tumours, and to Blondo, in that of wounds in general; while in the hands of Mariano, lithotomy became at length a branch of the regular profession. He adopted the method of operating by what is

called the Apparatus Major, invented a short time before by De Romani; and this, it is well known, was for a long time almost the only method employed; that introduced a few years afterwards by Franco, of cutting above the pubes, having done very little in superseding it. Wury contributed essentially to remove many of the absurd prejudices of his time, particularly with respect to the continual use of sutures in promoting the adhesion of wounds, the constant application of the cautery, in stopping hæmorrhages, and the prevailing practice of incessantly probing ulcers, and stuffing them with tents; but it is, perhaps, to Parè and Guillemeau, that the surgery of this period is more materially indebted than to any of the authors before-named; to the former more particularly, for an improved treatment of gun-shot wounds, which at this time occupied (as an almost new thing) very considerable attention, and the peculiarities of which had been attributed to either the fire or the poison, which was supposed to accompany the ball, as well as for the introduction of the seton in the cure of the hydrocele, and the final rejection of the cautery, in favour of ligatures, in the treat-

ment of hæmorrhage; and to the latter more especially, for the improvements which he made in the operation of trephining, and for the introduction of the practice of tying the artery above the tumour in the cure of aneurisms.

Nevertheless, surgery still continued in a very degrading state of association with the barbers of the age, to whose hands all the minor operations at least, including, probably, most of those subsequently confided to the dentists, were still committed. The surgeons of Paris, who, since the time of Lanfranc, had constituted a particular college, had before the commencement of the 16th century, made re-iterated complaints on this subject, to the faculty of medicine; the only result of which was, that they were allowed to enjoy a certain pre-eminence over the barbers, on paying sixteen sous annually to the said faculty. Things became worse, however, soon afterwards, the physicians of Paris having, in 1505, concluded a treaty with the barbers, by which the latter were, on certain conditions, admitted members of the faculty, and dignified with the title of *Tonsores Chirurgici*, instead of *Barbitonsores*, by which they had previously been known.

Ten years afterwards, Barât, the President of the College of Surgeons, by addressing his complaints to the University of Paris, instead of the Faculty of Medicine, obtained for the surgeons a partial emancipation from that state of vassalage in which they had hitherto been held by the physicians; and the college was soon afterwards acknowledged as a learned institution, with the privilege of constituting its own Masters, Bachelors, Licentiates, and Doctors in Surgery. These privileges, in spite of the frequent and vexatious opposition of the Faculty of Medicine, the surgeons still continued to enjoy; so much so, that in 1596, they issued a decree, by which the barbers were compelled to call in a sworn surgeon, in every case of importance, and to confine themselves entirely to the most trivial accidents; but, as the majority of those which befall the teeth, are commonly considered in that light, it is probable that the barbers of this period were still the principal dentists of the age. We hear of an oculist about this time, as distinct from a general practitioner in surgery, in the person of Bartisch, oculist to the Elector of Saxony; but of a professed dentist, no mention is hitherto to be met with.

The seventeenth century, was distinguished, not like the sixteenth, by the rise into celebrity of universities, hitherto almost unknown, but by the establishment, in many countries of Europe, of philosophical and learned societies, the happy influence of which, in the progress of medical science, was soon to become as eminently conspicuous. It was towards the close of the sixteenth century, that the brilliant discoveries of Copernicus in Poland, and Galileo in Italy, and the writings of Bacon Lord Verulam, in England, opened the eyes of men to the only true way of prosecuting the study of physical philosophy, and led them to the method of experiment and induction, from which they had been so long diverted by the metaphysical subtleties of Aristotle and his followers. It was to the strong enthusiasm for experimental philosophy, thus diffused all over Europe, that we owe the establishment in England of the Royal Society in 1663, in France of the Academy of Sciences, in 1666, in Germany, of the *Academia Naturæ Curiosorum*, in 1670, in Italy, of the Academy del Cimento, about the same period; and in other European countries, of other institutions,

the object of all which, was of a similar nature. The advancement thus rapidly effected in natural philosophy soon extended itself to medicine; and the accumulation of new facts, in every branch of this extensive science, was, in a short time, so great, that a more especial attention to a few departments alone became indispensable, in order to excel. Hence arose, among medical men, a more minute division of labour than had been known since the time of the Egyptians; and this minute division of labour was, in its turn, a cause of still greater progress in the several departments of medicine, by concentrating the energies of individuals, to particular branches, instead of dividing them among the whole. It was then, at this period, that the dental art began to be exclusively cultivated by a certain class of medical practitioners, and that we now, for the first time, meet with the appellation of surgeon-dentists, a title given, so early as 1622, to Gillies, and others, in France, but not for many years afterwards fully established; and accordingly we find B. Martin, who wrote in 1670, and whose work on the teeth was then next to Hémand's, that in the greatest repute, designated by Fau-

chard, as a mere apothecary. It was a little before this period that the possibility of transplanting the teeth from the head of one person to that of another, though not unknown to Parè, or even to the ancients, was confirmed by Bartholin,* and subsequently announced with great pomp, as a discovery, by Dupont; but his arrogance, or ignorance in this matter, may be more easily excused, when we find Mr. Fox, more than 150 years afterwards, attributing the introduction of this practice to John Hunter.

It was not till the year 1700, that persons destined for the profession of dentists, were compelled, in France, to undergo a regular examination; and it is from this period, perhaps, that we must date the establishment, in modern times, of the dental art, as a distinct branch of medical practice. Among those who during the last century, principally distinguished themselves as dentists, were Berdmore, Fauchard, Gerauldy, Larini, Bunon, Mouton, Lecluse, Bourdet, Aitken, De Chemant, Ray, Moore, and Talma; and it is to

* Hist. Anat. Cent. III. n. 66.

1700 - Examination in
France - Dental art

the undivided attention which such men as these were thus enabled to devote to one particular object, that we must ascribe the vast additions made during that period, to our knowledge of the structure and diseases of the teeth, and of the best means of treating the latter. By Berdmore, in 1723, considerable improvements were made in the construction and adaptation of artificial teeth:* and by Fauchard, in 1728, the result of forty years' extensive experience in this department of surgical practice, was collected into a code of instruction in the dental art, more perfect than any previously published.† He was one of the first to offer any satisfactory directions for obviating defects in the palate, and gives plates of no fewer than five kinds of obturateurs for that purpose.‡ Gerauldy and Larini, in 1737 and 1740, still further improved the structure of some of the instruments then commonly used in operating on the teeth;|| and Bunon, in 1741, besides describing with great

* Act. Emd. Lips. 1723.

† Le Chirurgien Dentiste, on Traté des Dentes.

‡ L'Art. de Conserver les Dents.

Trattato sopra la qualita de' Denti, &c.

|| See Treatise on Obturateurs, by J. Snell.

Fauchard

accuracy, many of the diseases of the teeth, helped to remove the prejudices previously existing respecting their extraction in pregnant women.* By Mouton, in 1746, some further improvements were made in the method of adapting artificial teeth;† and Lecluse, in 1754, recommended some particular instrument, of his own invention, for the purpose of filing them.‡ One of the first to construct and fix successfully, whole sets of artificial teeth, was Bourdet, in 1757, and he materially improved also many of the instruments then commonly in use by dentists;|| but a chief improvement in such instruments, (at least so esteemed at the time,) was that made by Aitken and Simpson, who endeavoured, in 1771 and 1800, to supersede the old crow's-bill, pelican, &c. which had been before generally employed in extracting the teeth, and the operation of which was in an oblique direction, by instruments, which should operate perpendicularly, and thus extract the

* Essai sur les Maladies des Dents, &c.

† Essai d'Odontotechnie.

‡ Nouveaux Elémens d'Odontologie, &c.

|| Recherches et Observations sur toutes les parties de l'art du dentiste.

Bourdet - 1757 - first full
dentures successfully made

De Chemant
first porcelain teeth
1797

teeth upon almost the same principle as a cork is withdrawn from a bottle.* De Chemant, in 1797, invented a composition for artificial teeth, composed of a kind of porcelain, some of the advantages of which are sufficiently apparent. Talma is considered to be the first who introduced into this country the practice of placing natural teeth on gold plates. Ray was a lecturer on the teeth, in the time of John Hunter; lastly, Moore was also a lecturer, and an extremely intelligent and well-informed man.

In the present century the authors who have written on the structure and diseases of the teeth, are still more numerous, and the improvements which have been made, in the same degree more considerable; the anatomy and physiology of these organs being more clearly elucidated and understood, than at any former period. It is sufficient to mention here the names of Hunter, Blake, Fox, Duval, Le Forgue, De la Barre, Beaume, Maury, and last, although by no means the least in importance, the work lately published by my friend Mr. T. Bell, which more than fulfils all the purposes designed

* Aitken's Essays, &c.

by the author. In conclusion, I cannot avoid observing, that the cultivators of the dental art have, at all times, evinced an anxious desire to avail themselves, as far as possible, of the progressive discoveries made in every other branch of science, not only mechanical but chemical. In proof of this, I might mention the great degree of perfection attained in the composition and general construction of mineral teeth, in all their beautiful varieties, and the modern method of fixing artificial teeth, which is incomparably superior to all preceding ones. Comparatively perfect as the art appears at present, we may reasonably hope that it will continue to participate in those important improvements which, in every department of human knowledge, are every where making around us. This hope, however, does not at all rest upon the professions of those impudent pretenders, who are constantly pressing upon the public notice, their discoveries of new and infallible remedies, each of which turns out, upon examination, to be either a revival of some antiquated practice, which the advance of science has long since exploded, or such a novelty as could only have been devised by a mind inno-

cent of all knowledge, anatomical, physiological, chemical, and mechanical. The art will continue to advance ; but it will be by the labours of men, who, with profound knowledge, unite solid judgment and extensive practical experience.

Having thus given a brief sketch of the progress of our art, from the earliest era to the present time, I shall at once direct the attention of the reader to the main object of the work ; that of affording to students and young practitioners, information on the operative part of the profession, which they cannot obtain from any other. It will be my endeavour to omit nothing useful ; and I shall be equally anxious to insert nothing superfluous. My aim is to produce a manual of practice, concise, yet I trust complete ; so arranged as to present a natural and convenient progression, when read continuously, and to facilitate the researches of those who may consult it as a book of reference. With this view, certain general heads have been adopted, beginning with the operating chair.

OPERATING CHAIR.

THERE is no part of the apparatus of the dentist of more importance to his success, than a good operating chair. To this particular, the professors of this country have not paid sufficient attention, most of them having nothing but a common arm chair, the use of which must, in many cases, be alike inconvenient to the operator, and fatiguing to the patient. The impropriety of placing the latter in the same position for every operation, is evident. If a patient, requiring one of the superior molares stopped, is placed in such a seat as would be proper for performing the same operation on a tooth in the lower jaw. the position of the head

must be a most painful one, especially if the operation should take up any considerable portion of time, which is often unavoidable. The patient probably does not complain; but his forbearance arises from his want of knowing that it is possible to have all the operations on the teeth performed, without his being placed in any position that is not perfectly easy, and as little productive of fatigue as a natural lounge. This, however, may be accomplished by the use of a chair constructed upon truly scientific principles; the parts so arranged that the whole may tend to promote the ease of the patient, and to facilitate the performance of every species of operation. Every dentist who is anxious to maintain his character, as an expert and elegant operator, will find it to his advantage to possess such a chair. It is, indeed, the duty of a professional man, to provide himself with every thing which is calculated to give ease to his patient, or to promote the success of his own operations; and he who wilfully neglects these important objects, deserves neither the confidence nor the fees of his patients.

Some few dentists have operating chairs, and I have seen several, made by different artists.

All, however, that have fallen under my notice, with the exception of that used by my friend Mr. Morel, manifested such a want of skill in their construction as rendered them of little utility. Their deficiencies arose from a single cause, namely, that the projectors and manufacturers not being dentists, had very indistinct notions of what was required; they were not aware of the various positions in which it is requisite to place the patient, and in consequence of their inadequate information, the chairs which they produced, were very inefficient substitutes for that perfect one which the dentists ought to possess. No manufacturer indeed, can be expected to make a suitable chair, except under the direction of a good dentist, who, combining with accurate theoretical principles, considerable professional experience, shall moreover have been in the habit of performing his operations, not in the slovenly way, which is too common, but in a neat and scientific manner. It is remarkable, that throughout all the works on the subject of the dentist's art, we find no notice of an operating chair, except in a late treatise, the author of which speaks of one, which he states to be as near perfection as

possible; but as he does not, by describing it, give us an opportunity of judging of its merit, it is in the situation of many other wonders, of which we have heard and read:—it is to us *vox et preterea nihil*.

In constructing an operating chair, three things should be principally kept in view:—*First*, the chair should afford the means of placing the patient in all the various positions which may be conducive to his ease, and the convenience of the operator.—*Secondly*, it should have attached to it all the more cumbersome articles which may be required in operating, and which cannot be held in the hand, or otherwise disposed of without inconvenience; all of which should be so arranged that they will be, as it were, dumb waiters upon the operator.—*Thirdly*, to ensure the firmness of the patient's position, an apparatus must be affixed, upon which the feet may rest, which should be capable of being accommodated to varying circumstances, as whether the patient is sitting high or low, or whether his legs are long or short.

It may be objected, that a chair with so much machinery is calculated to intimidate; that the

shifting of the different parts will occasion loss of time, and that there is a formality and parade about it which the generality of patients will dislike. I do not hesitate to confess, that at a former period, such was my own opinion; it was yielded, however, to that which I am persuaded will produce conviction upon the mind of every unprejudiced professor—practical experience.

For some years I used nothing but a common arm chair, but I was so constantly encountering proofs of its inconvenience, both to myself and the patient, that I felt it my duty to construct a chair, better adapted to the purpose. Having done so, I can say with sincerity, that I have never ceased to blame myself for having so long neglected it.

If the chair is properly constructed, a very small portion of time is consumed in adjusting it; and as to the patients, although a little timidity is manifested by some, it is immediately dispelled by finding themselves in a position perfectly natural and easy, and which, however long maintained, does not become irksome.

In extracting teeth, (independent of the advantage to the operator,) the consciousness of an easy and firm position, inspires

the patient with a degree of confidence which, at a time when he is to make up his mind to submit to a painful operation, is invaluable.

I shall illustrate my notion of a good operating chair, by referring to my own. Without affirming it to be the best of its kind, I can confidently state, that having used it for some years, I have found it to possess almost every requisite qualification. I shall commence with the skeleton, and proceed through the various parts, and their uses.—The frame-work should be rather heavy; the feet firmly fastened to the floor; the arms and legs may be made as to pattern, according to the taste of the possessor, but the wood should be the best Spanish mahogany, rosewood, or some other heavy material, that it may be rendered solid and firm, capable of bearing the parts which are to be attached; the seats should be broad and roomy, at least 2 ft. by 20 ins. This being a most important part, will be hereafter described more particularly. The back should be nearly 4 feet in height, and moveable by hinges attached to the lower part of the frame-work of the seat; it should be capable of falling backwards, completely horizontal, or

of remaining at any angle which the operator may require : this latter point is attained by a piece of brass, formed, in the segment of a circle, one end being attached to each side of the frame-work of the back-board, the other part being made to pass through the post of the arm of the chair. This piece of brass must be perforated with holes, at the distance of an inch from each other ; a brass bolt passing through the post and through one of the holes, according to the angle required, will hold the back firmly. The position may be changed in a moment, by the simple removal of the bolt to any other hole, which will enable the operator to place the patient in every variety of position, from the perpendicular to the horizontal. This is particularly useful in cases of sudden fainting.

At about one foot from the top, the back of the chair should be divided, and made capable of falling down, by hinges. These hinges should be so constructed that their lower parts should not be fixed, but allowed to fall into sockets, so that the upper part of the back may, when required, be removed altogether. This moveable portion of the back should be retained, when put up, by two strong

brass snaps, which, by touching a spring attached to each, will allow it readily to fall down. On the left hand side of the chair should be placed a half oval flat cushion, stuffed to the shape of the head, and about a foot in circumference: this is for the patient's head to rest against, and should be capable of being raised or depressed by means of a brass rack or groove, through which the back part of the cushion should traverse, and for which purpose it should be provided with corresponding projections made of brass, the cushion being retained in any situation that may be required by means of a small spring and snap. Another of these flat cushions should be attached to the top of the chair, which should be capable of traversing from right to left, along the upper part of the chair: this upper cushion should also take off, and when occasion requires, should be affixed to the lower part of the back of the chair, when the upper and moveable part which falls down, is removed. It should further be capable of moving from or towards the operator.

When the whole back part of the chair is allowed to slope, which is almost always the

case, in a greater or less degree, the patient being seated, and leaning back, the shoulders and head alone would touch; the back and loins would therefore be without support. To remedy this, a large cushion should be placed between the patient's back, and the back of the chair; this cushion should be the height of the chair, at that part where it is separated. It should be about 20 inches in length, and 18 inches in breadth. It is requisite that this cushion should be most carefully made; it should be of leather, and very exactly stuffed to the shape of the back, that in whatever position the patient may sit or recline, it may be felt equally from the shoulders downwards. On the proper shape and stuffing of this cushion, depend much of the ease of the patient.

As all patients have not the same length of back, of course the head will not always rest in the same situation; to remedy this, the cushion should be no longer than will be necessary to reach the shoulders of a middle-sized man, and should be flat at the top, to admit of a smaller cushion the length of the breadth of the chair, of a triangular form, the anterior part being rounded. Two or three of these little

cushions should be provided of different depths, so that the patient's head may be placed in any position, from the perpendicular to the horizontal.

Many operations on the upper teeth require that the patient's head should be considerably above the operator; at least if much time is to be occupied in the operation, such a relative position will be found more agreeable to both parties. It is desirable therefore, in such cases, that the seat of the chair should be raised, in order that the head of the patient may be brought to its proper elevation. This may be done by extra cushions; but as there is some inconvenience attending such a method, it is much better to have the seat of the chair capable of being raised, by springs placed underneath it. Spiral springs may be so placed as to add very much to the comfort of the seat, and raise the patient at once to a proper height. This is accomplished by the cushion seat working in a rack in the posts of the chair, and being raised or depressed by a small lever under the chair. It is only for the operator, when he would wish the patient to sit lower, to press down the lever, and the little snaps in the

rack will retain at the desired point of depression. If, on the contrary, the patient requires elevating, the operator has only to take out the bolts which retain the seat in its depressed situation, and the power of the springs will cause it to rise. It will not be necessary for the patient to quit the chair, except in the case of a very heavy person.

When the seat rises, the back cushion which rests upon it, of course, rises also, affording, under all circumstances, the same convenient support to the back. When the patient is raised, the flat cushion against which the head is rested laterally, must also be raised, so that it may be exactly adapted to the situation of the head. From the arrangement of these cushions it will be found, that the head is always retained with steadiness in the exact situation required. The importance of this to the operator, need not be insisted on. Having described the situation of the patient's body and head, when seated in the operating chair, it next becomes requisite to describe the means by which the feet are made to rest with firmness and ease to the patient, throughout the various positions. When the patient's seat is raised, it is obvious,

that if no supports were provided for the legs, their position would be a most disagreeable one. To remedy this, a foot-stool or foot-board is provided, capable of being raised or depressed to any requisite degree of height, while the upper part, upon which rests the feet, is at all times upon the level. This stool is composed of three pieces of mahogany, of two feet in length, and 13 inches in breadth, the lower piece being shaped like an extremely shallow box, and capable of partially retaining the two upper pieces, which lie flat on each other: between each of the pieces is placed a double brass rack, acting in opposite directions. That between the upper and middle board enables the upper one to be elevated; but as this can only be effected at an angle, the front part being higher than the back, a similar rack must be placed between the middle and lower parts, which acts in the opposite direction, by allowing the posterior part to be raised. By this arrangement, the upper surface will, if required, always present a perfect plane, at whatever elevation it may be placed; or should it be more agreeable to the patient, it may be depressed or raised at either end, adverse to its opposite; thus, when the

patient is raised in the chair, the height of the footstool, and its position, may be regulated according to the length of the patient's legs. To give greater firmness to the feet, the upper surface of the footstool, at its anterior part, is provided with a triangular piece of wood, upon which the soles of the feet rest agreeably. The upper surface should be covered with soft carpeting. Although this footstool may from the description appear to be complicated, when viewed it will be found extremely simple, the alterations of its position being performed merely by raising or depressing the anterior parts of the upper board. Depressing will raise the back part, as the contrary operation will the front. The stool should be placed on rollers, and should run in two rods attached to the floor, that it may be pushed under the chair, when not required.

Connected with the chair are certain appurtenances which remain to be noticed. To the anterior extremity of the right arm is to be affixed a moveable table, of about a foot in circumference, capable of being turned in any direction. This is useful for the purpose of

placing an instrument, or any thing else required in operating. To the left arm is to be affixed a powerful mirror, also capable of being moved in any direction. In fixing artificial teeth, and in fact, for innumerable purposes, this mirror will be found useful, doing away with the necessity of the patient's either rising to look at a glass in the room, or holding one in his hand. In all operations requiring a candle, as in using the actual cautery and metallic cement, it is usual for the patient to hold it in his left hand. This is in all cases a clumsy expedient, and nothing can be conceived more awkward than to request a lady to perform such an office, especially when she is agitated by the anticipation of pain. Where a light is necessary, it is much better to have a lamp, or thick wax light, placed in a branch, the opposite end of which is attached to the left-hand side of the back of the operating chair. This branch should have a sufficient number of joints, that the lights may be placed in any situation, in front of the mouth, which the operator may require. This is far better than the former uncertain and ungraceful method.

In order that my chair may be better understood, I have given a plate, with the different parts affixed, as also the foot-board.—This, it will be observed, is pushed back a little, under the chair, to get the drawing within the octavo size.—*See the Frontispiece.*

EXTRACTION OF THE TEETH.

FROM the earliest period the strongest aversion has existed to the extraction of teeth. This feeling has descended to our own times; for there is certainly no operation, the performance of which is so generally repulsive to the feelings of the practitioner; and it is by no means uncommon to hear surgeons affirm, that they would sooner amputate a limb than extract a tooth. We shall not be surprised at the repugnance to this operation, entertained by the ancients, if we consider the nature of their instruments, in the use of which, according to their own showing, they were liable to the most frightful accidents. We find even Ambrose Paré ad-

vising, that "a tooth-drawer should be expert
"and diligent in the use of his tooth-mullets,
"for unless he knows readily and cunningly
"how to use them, he can scarcely so carry
"himself but that he will force out three teeth
"at once, oftentimes leaving the one untouched
"which caused the pain." It may readily be
conceived, that the operation of extraction, with
instruments, capable of so little nicety in their
application, should excite a degree of aversion,
not easy to be overcome; but it is not so easy
to account for such a feeling existing in the
present day. The removal of a tooth is now
so well understood, that if performed by a
skilful hand, the patient may be almost assured
of its terminating successfully, and producing
comparatively, but little pain. The truth per-
haps is, that among the great variety of instru-
ments recommended, the practitioner is at a
loss which to choose, and frequently choosing
wrong, continual failure produces a want of
confidence, and a consequent dislike to the
performance of the operation. Considerable
difference of opinion exists, and will probably
continue to exist, as to which are the best
instruments; each operator feeling a preference

for that with which he has been accustomed to operate successfully. No one, indeed, can remove teeth with an instrument, however excellent, to the use of which he is unaccustomed, so well as with one which he has been in the constant habit of using. Yet, success depends in a great degree, on the use of well-constructed instruments, properly adapted for the removal of each particular tooth; for no single instrument is adapted for the removal of all. Every dentist should therefore be provided with a sufficient variety of instruments, and should acquire the habit of using them without embarrassment. With the hope of assisting the young practitioner in making a proper choice, I shall make some observations on the various classes of instruments; but bearing in mind the fact just adverted to, that every man can operate most readily, and probably most successfully, in his own way, and with his accustomed instruments, I shall offer my own opinion with delicacy, especially upon points wherein I may differ from previous authors. In the course of an extensive gratuitous practice, I have had ample opportunities of trying every variety of instrument which has been offered to the pro-

fession for some years past, and of ascertaining, by experiment, the respective value of each. The opinions therefore advanced, are the results of actual experience.

While the removal of a tooth may be accomplished with equal adroitness by two operators, using totally different instruments, it is difficult to determine which instrument is preferable in point of facility, and from the number of circumstances which may intervene: it is still more difficult to ascertain which instrument gives the least pain to the patient; for even where two teeth of the same class, being a perfect pair, and situated at opposite sides of the mouth, are extracted in immediate succession, and with the same instrument, it will frequently happen, that the removal of one will give much more pain than that of the other. If toothache exist in the one, and not in the other, the extraction of the former will be the more painful, from its involucres being under inflammation. This I can assert from experience. Having last year had considerable pain in the first molar tooth, on the right side of the upper jaw, and the corresponding tooth on the opposite side being also much decayed, I made up

my mind to remove them, whenever an attack of tooth-ache should come on. This, after a time, occurred; a portion of food getting into the cavity of the tooth on the right side, produced the most violent pain. After suffering some time, I removed it with the large forceps in a slow and firm manner. The pain was certainly considerable, but I confess, very much less than I had made up my mind to. This encouraged me to remove the other at once, which I did, with the same instrument, and was equally surprised and pleased to find the operation effected with scarcely a quarter of the pain which I endured with the former tooth.

As these teeth were a pair, and when compared, after extraction, almost completely resembled each other, having each three long expanded fangs; were both removed with the same instrument, by the same hand, and with nearly similar power, there could be no cause for one giving so much more pain than the other, but the existence of inflammation. I had almost determined upon removing the second tooth with the key instrument, but having a decided preference for the forceps, in all cases where they can be used, I had again recourse

to them, and was not sorry that I did so, as it enabled me to ascertain, by experiment, an important fact.

In pursuing the subject of extraction, I shall first, make some preliminary observations on each particular instrument used for that purpose in the present day, and shall afterwards, describe more particularly, those which my own experience has led me to prefer, as well as the best method of applying them to the teeth, for whose removal they are suitable.

I shall begin with the forceps, probably the earliest instrument used, and for this reason, among others claiming our first attention. The instruments of former days, though rude in their construction, were the same in principle with the majority of those which in our own time have been put forth as new inventions, and which are very generally, no inventions at all. It is extremely rare to meet with an instrument which deserves the name of an invention; and what is worse, the alterations made, with a view to novelty, are not always for the better. This observation is not intended to discourage the application of ingenuity to the improvement of such instruments. No operation in surgery

is so frequent as the extraction of teeth: it is consequently not unreasonable to expect it to be performed both skilfully and expeditiously. The operation is one peculiarly revolting to the feelings of the patient: no assistance, therefore, that can either abridge the duration of suffering, or diminish its intensity, should be rejected. It is, however, a fact, that although we have had forceps of almost every possible variety, and each variety claiming the praise of novelty, these *inventions* have seldom been regarded as improvements upon their predecessors. Those very generally used, especially in France, (called in many of the old works hawk's-bill forceps,) and which are noticed in the very last work published on the subject by my friend Mr. Bell, are similar to those described by Celsus, under the name Valsella, as far back as the commencement of the christian era. If we observe those described by Albucasis and others, about the eleventh century, we shall find, that so far from any improvement having, down to that period, taken place, the very contrary was the fact. The changes, in the construction of these valuable instruments, were for the worse, until the time of Ambrose Paré,

and his pupil Guillemeau; the latter of whom gave plates of various kinds of forceps, among which he recommended that of Celsus; and could Celsus now be re-animated, he would find, even in this day of vaunted enlightenment, that the ages which separate his time from our own, have passed, without any improvement of consequence having been made in his extracting forceps.) It is therefore, almost useless to trace the progress of an instrument which appears to have altered so little for the better. The forceps of the present day, are principally of four kinds;—a straight pair; a pair with the chops bent round at right angles; a pair with the chops slightly curved, termed Cartwright's forceps; and the hawk's-bill forceps, so called from the chops resembling the bill of the hawk. There are others for perpendicular extraction, which I shall hereafter mention.

It appears, that for many years, the forceps was the only instrument used for extracting teeth. During this time the operation was considered of the most formidable nature, and danger was apprehended from the removal of any teeth which were not loose in the socket; but as confidence increased, and men made

the study of the teeth a distinct one from that of general surgery, it was ascertained that a greater power might be applied with safety, and the lever, in all its forms, became conjointly in use with the forceps.

In this country, during the last century, the use of the forceps, in extracting the back teeth, appears to have been in a great measure discontinued, in favour of the key instrument, until the former method was brought again into notice by Mr. Cartwright. The celebrity which he has so desiredly obtained as an extractor of teeth, with the forceps, may be considered as the joint result of his modification of the instrument, his skill in using it, and the novelty of applying it to the removal of the molar teeth; it having been the prevailing opinion, that they could not be removed by the forceps alone. I advance this without the most remote wish to deprive that gentleman of one of the laurels which he has so deservedly acquired. His ability as an operator, and his amiable character as a man, will at all times ensure him the highest respect from the liberal-minded of his profession.

Since the forceps have been brought again

into notice, they have become very generally used, and amongst well-informed practitioners, there is no longer any doubt as to the practicability of removing the back teeth by means of this instrument, with the greatest facility. The old hawk's-bill approaching nearer to the key in its action, has for this reason been found by some practitioners more convenient, which accounts for its return into use; but it is in every way inferior to the large forceps slightly curved. The cases in which the key instrument is to be preferred, are much fewer than may be supposed by those who have not acquired that degree of familiarity with the use of the forceps, which can only be obtained by considerable practice.

It is not surprising that operators should complain of want of success, while the instruments which are sold in the shops, under the name of Cartwrights forceps, are so far from being what they ought to be. With many of them the most common molar tooth cannot be removed without the risk of a fracture. The dentist should pay the most minute attention to the construction of his forceps. Whenever I have had a new set made, either for myself or

a friend, I have invariably ordered them to be delivered in the rough, in order that I might myself, do that which I have never yet found that an instrument-maker would do—render them exactly what they ought to be. Forceps should curve no more than is actually requisite for their proper adaptation to the teeth which they are intended to extract. Those bent at right angles are of little use; they are mechanically incorrect, as the more the instrument is curved, the more power is required, and the less can be given to it by the hand of the operator. Forceps should not be too heavy nor too long; the latter is a fault which is particularly objectionable. But in no part of the forceps is so much care requisite as in the beaks or chops; these should terminate as nearly as possible in the shape of the neck of the tooth to be removed, and should not approach each other by a space in proportion to its thickness. This will allow of the handles being kept more or less apart, so that when the tooth is grasped by the forceps, they may not be extended to such a distance as to render them inconvenient to the hand of the operator. One handle should be left longer than the other, and turned round in a hook,

which will pass over the operator's little finger, and will be found to assist in retaining the instrument firmly in the hand. In extracting a firm tooth, the hand is very apt to slip down the handle of the instrument, an accident which will often confuse the practitioner, and prolong the operation. In warm weather, when the hands become damp with perspiration, the hook will be found peculiarly useful in preventing this accident. Forceps suitable for the upper incisores, cuspidat, and bicuspidés, should be straight, the beaks terminating in the shape of each particular class of teeth. The dentist should possess at least two or three pairs of different sizes; those for the bicuspidés being more pointed at their extremity, that they may be introduced as high up under the gum as possible, as of all teeth, none are so likely to break under the forceps. Nothing can be more simple or more easy than the extraction of the front teeth: the instrument should be merely placed as high up as the gum will allow, and the tooth grasped with just sufficient firmness to retain it within the forceps; a slight pressure outwards and inwards combined with a slight rotatory motion, and when the tooth

is felt to give way, a smart force applied in the direction of the socket downwards, and it is removed. The exact motion, which is a preliminary to pulling the tooth from the socket, cannot be very accurately described; practice is the best, and indeed the only efficient preceptor. In the bicuspidæ, rotatory motion is useless; the simplest pressure outwards and inwards is all that is requisite. It is not necessary to separate the gum from these teeth, unless in some cases for the better fixing the nibs of the instrument. For the upper molares, a strong pair of forceps is required, just sufficiently curved to keep the handles free from the lower teeth. The practitioner should be provided with two pairs—one for each side; the termination of the inner chop, should be in a flat groove similar to the shape of the tooth on that side, which it will be remembered, is the side where the single large fang is situated. The outer chop should terminate in two grooves, with a fine point in the centre, which point should be carefully introduced, as nearly as possible, between the two fangs, which are situated on the outer side. The convenience of two pairs of forceps is evi-

dent, as each pair would be especially adapted to one side. The tooth having been firmly grasped with a pair of these forceps placed sufficiently high, and having been pressed firmly outwards and inwards, may be removed with the greatest facility.

The careful adaptation of the points to the neck of the tooth, averts the danger arising from touching the tooth at two points only, which is too often the case with the forceps in common use, and is very frequently the cause of a fracture. Such a hold is obtained as will not give way, and the tooth is embraced sufficiently high to be in most cases above that part which is decayed. (See the Plate.)

Forceps for the *dentes sapientiæ* of the upper jaw, should be rather more curved, and of a smaller kind, terminating in a flat groove. These teeth, if the decayed part is not situated very unfavourably, may be removed with much ease by the forceps, as their attachment to the jaw is usually very slight, the process being soft and spongy, and giving way to the slightest force; but they are the most difficult and dangerous to remove with the key, especially if the fulcrum is placed in the inside of the mouth.

Where however the decay is so situated as to render the forceps inadmissible, the double lever is the best instrument. The method of applying it I shall hereafter describe.

The incisores of the lower jaw, if not irregularly placed, and if there be room for the beak of the forceps, are removed best with a light pair slightly curved. Forceps curved at right angles are generally used for this purpose, but all operators will discard them who have tried those just recommended. The patient's head should be taken under the operator's left arm, and depressed on one side towards his breast; his hand should then support the lower jaw, and the tooth should be removed as before described in the upper jaw.

Where these teeth are much decayed low down in the socket, the double elevator must be used; but where they are removed for irregularity, and there is not room for the beaks of the forceps to be properly placed, without injuring the adjoining teeth, if the tooth to be removed stands before the rest, a pair of forceps is requisite, having a peculiar curve in an opposite direction to the common ones, and the beaks made to enable them to embrace the

tooth laterally. The tooth being secured, a little shaking motion is requisite, and it will then easily be displaced. If, however, it is so situated that this cannot be effected, (of which the operator must of course judge,) the single lever may be introduced between the tooth to be removed and the adjoining one; and by slightly turning the handle, the tooth will be easily raised. Where the tooth is in the inside of the mouth, behind, or between the adjoining teeth, the operator must use a pair of forceps that will grasp the tooth laterally. Extraordinary cases will occasionally present themselves, for which rules cannot be given, and which must be managed in the best manner that the artist's skill and ingenuity can devise.

There are perhaps, no teeth that so seldom require removing as the canine teeth of the lower jaw. When necessary to extract them, a pair of forceps will be required similar to those used for the incisores, but with the groove at the points rather larger. These teeth are placed extremely firm in the jaw, and when much decayed, require very firm and cautious management in removing them. The external portion of the process is often very thin, for half the

length of the tooth, which allows it to be detached from the fibres by firm pressure outwards; and when this is effected, it is readily lifted out of the socket. The bicuspidæ of the lower jaw are easily removed with the same forceps that are used for the canine teeth, and in a somewhat similar manner.

The molares of the lower jaw require two pairs of forceps, one for each side, on account of the hook to turn round the little finger, which it will be evident, must be on opposite sides of the instrument, for the opposite sides of the mouth. These forceps should be strong, with the beaks short, and terminated by a double groove, with a fine point in the centre of each, so situated that as the lower molar teeth have two fangs only, the two points may be introduced between them. These forceps should be curved just enough to enable them to grasp the tooth conveniently, and to allow the handles, when the instrument is applied, to be clear of the upper teeth. (See Plate.)

If the tooth is on the patient's left side, it is better to place the head depressed on one side, against the breast of the operator, whilst the left hand supports the jaw, by being passed

over the patient's head. The tooth must be then firmly grasped, pressed outwards and inwards, and lifted out of the socket.

When the tooth to be removed is on the right side, the operator must stand before his patient, first placing the head against the cheek of the operating chair; the jaw is then to be firmly held by the left hand, the thumb being placed on the grinding surface of the anterior teeth, and the operation is to be finished in the way just described. The *dentes sapientiæ* are to be removed in a similar manner when practicable; but when, as often happens, decay will not permit this mode of removal, the double lever must be used;—the forceps can only be used with success by those who are possessed of a great deal of coolness and confidence. If an attempt be made to raise the tooth before it is slightly detached from its membranous adhesions to the socket, the attempt will be in vain. I scarcely believe, that the exertion of the whole strength of a man could pull out a molar tooth, firmly fixed in the socket, without first detaching it by the requisite rotatory movement. The great error of young beginners, with the forceps, is this:—they begin to pull the tooth from the socket

before it is detached from its membranes. In consequence of their being foiled in this attempt, they become embarrassed, and in their efforts to remove the tooth, too much pressure is made on the handles of the instrument ; the result is, that the tooth is crushed under the gripe of the forceps. Practice, and practice alone, will give the necessary precision and confidence.

A variety of forceps for perpendicular extraction, have been offered to the profession at different periods, to none of which is much importance to be attached. That this is a fact is evident ; each newly-invented instrument for this purpose remaining popular so long only as the inventor continues to advertise : this being discontinued, the instrument is soon forgotten, and the instrument makers are burdened with a stock of unsaleable articles.

Numberless inventions of this kind might be mentioned, many of which have excited considerable temporary interest, and for which, certificates of satisfaction have been given by many of the heads of the medical profession. I cannot allow this opportunity to pass without pointing out the impropriety of men of

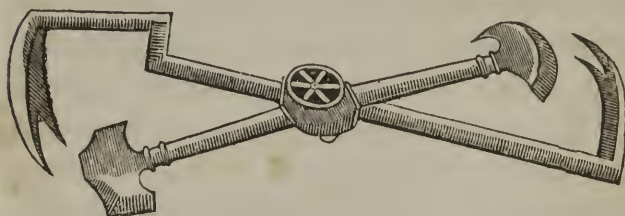
eminence giving certificates of this kind to every applicant, as it is utterly impossible, from the nature of their practice, that they can be able to form a judgment as to the practical utility of an instrument for extracting teeth, an operation which probably they seldom see performed.

The Elevator being the instrument which followed the use of the forceps, is next deserving of attention. From the description given by some of the ancients, of the method of using this instrument, tooth-drawing really appears to have been a formidable matter, and to have well warranted the cautions given, and the fear expressed, as to the dangers which might ensue. Of late the simple, straight elevator has been used by many of the profession, even in the extraction of the molar teeth. The striking resemblance of this instrument to those of former days, again calls upon us to notice how small has been our advance upon the ancients. Many of the modern instruments are so similar to those delineated in the old works, that after allowing something to the superior workmanship of modern manufacturers, we may affirm that there has been little difference since the time of Albucasis.

Some of the elevators described and recommended by the ancients, are of such strange shapes, that a man would be truly puzzled to turn them to their proposed uses; but an inclination to produce variety, by multiplying odd-looking instruments, is not confined to our part of the profession amongst the ancient authors. The elevators used in the present day, are principally of two kinds; the one commonly termed the punch, for removing stumps; and the more improved elevator for the removal of the molares,—an instrument about six inches in length, set firmly in a long, strong handle, having a lance-shaped blade, flat on one side, somewhat concave, raised on the other side, and tapering to the point. This instrument originated with a dentist who is since dead, and was intended for the removal of the *dentes sapientiæ*. It is, however, used by some practitioners for the purpose of removing the molares, by inserting its points between the fangs, and making the edge of the socket the fulcrum. The propriety of this method is very questionable. Its success must be doubtful where the points of the fangs either diverge or converge much. In either case the

attempt to remove the tooth perpendicularly with such a power, is, I conceive, objectionable. Notwithstanding this, the elevator is, when properly constructed, an instrument of the highest utility, and one with which it would be difficult to dispense. The method of using it, and its various shapes, I shall hereafter describe.

After the elevator we find an instrument similar in its action to the key, except that the power is not so well or so safely applied.



A great variety of modifications of this instrument have been made, gradually improving it, the principal of which is, in application of the power by using a handle instead of the perpendicular lever, and in the different arrangement of the fulcrum and claw.

Were it not for the great addition which plates necessarily make to the price of a work, I should have given diagrams of all the prin-

cipal improvements of this instrument to the present day. There is, perhaps, no one so generally useful, nor the command of which is so easily acquired; and were a man so circumstanced that he could obtain but one instrument, there is none which would answer all purposes so well as the key. Numerous attempts have been made, within the last forty years, to improve this instrument. Several have been constructed for the removal of the tooth perpendicularly; but though some of them display great ingenuity, they are not fit for general use. Perhaps the most extraordinary instrument of the kind, was that invented by the celebrated Martin Van Butchell. It was rather complicated, but extremely ingenious. It is now in the possession of Mr. Thompson, the instrument-maker. It is not generally known, that amongst the number of his occupations, Van Butchell was a good dentist, as a mechanic particularly.

Amongst the instruments which, within the last few years have been proposed, there have been a variety, for perpendicular extraction, in the shape of forceps, with a fulcrum to rest upon the adjoining teeth.

To say nothing of the impossibility of removing some teeth perpendicularly, these instruments are not calculated for general practice; and an instrument that may only occasionally succeed, is of little value. The production of an instrument less liable to fail in removing a tooth safely and expeditiously than any preceding one, is the object to which ingenuity should be directed. It is, however, with the numberless new instruments constantly offered to notice, as with the numberless adventurers daily starting up in our profession, those which possess merit establish themselves, the rest in time find their level.

Although I believe the key instrument to be the most generally useful, it is one to which I seldom have recourse. I would not, however, recommend others to discontinue its use, unless they have had an opportunity of acquiring that degree of proficiency in the use of the forceps which constant habit alone can give. My reasons for preferring the forceps, are that they give much less pain than any other instrument, and are also liable to fewer accidents. In fact almost the only accident that can occur, is breaking the tooth; and this

will but rarely happen if the nibs of the forceps are properly constructed, and the hand has acquired the requisite tact in using them; not pressing the handles more than is necessary to retain the tooth, whilst the required preparatory motion is made, previous to its removal from the socket.

As however but few persons enjoy the opportunity of acquiring the perfect mastery of the forceps, it will be prudent in the majority of practitioners to resort to the use of the key; I shall therefore describe the kind of key instrument which I occasionally use myself, and would recommend to others.—*See plate.*

It is of course presumed, that the bicuspidæ and molares are the only teeth which require the use of this instrument.

Without entering into the discussion of the question, whether the teeth should be removed outwards or inwards, which each author has considered of so much importance, and has peremptorily decided—to his own satisfaction at least—I shall simply give the result of my own experience; having tried, in my gratuitous practice, every variety of instrument, for the joint purpose of ascertaining by experiment

which were to be preferred, and of initiating my pupils in the use of them.

In using the key instrument, a few simple circumstances, if attended to, will almost insure success; and regard to a few points in the construction of the instrument, will very materially add to its utility.

It is not of so much consequence to lay down any rule that the teeth are all to be extracted inwardly or outwardly, as to point out how each particular tooth can be removed most conveniently to the operator, and with the least pain to the patient. As a preliminary, I would observe that the instrument can be most conveniently applied, will retain its proper situation on the tooth, and will act altogether in the manner most conducive to the success of the operation, when the palm of the hand is beneath the handle, instead of above it; from the circumstance that when the hand is in the former situation, it is capable of lifting the tooth upwards as it becomes detached, whilst in the latter position, the power is rather exerted in the opposite direction towards the bottom of the socket. I would also strongly recommend that the elbow of the right arm, instead of being

raised at the commencement of the operation, should, on the contrary, be depressed, and fixed closely to the side. One motion alone is required; the tooth is to be elevated, which is best accomplished by the simple rotation of the wrist. If the elbow is raised when the operation is commenced, its motion will combine with that of the wrist and be depressed, which will give to the instrument a horizontal motion, conducive neither to the expedition of the operation, nor the ease of the patient.

All rules for extracting teeth must be subject to limitations, as circumstances will occasionally interfere, to throw the operator upon his own resources.

An experienced man can generally determine by looking at the tooth, in which way it can best be removed; but as a general rule, I should recommend that all the teeth should be removed with the palm of the hand placed under the handle of the instrument, for the reasons I have before assigned. There are, however, two exceptions; the two bicuspides of the lower jaw on the right side, and the two bicuspides and two molares on the left side of the upper jaw, should always be removed inwards, which

cannot be effected, but with the hand in the opposite position.

Much less power than is generally used, is sufficient to remove a tooth with the key instrument, if that power is scientifically applied: but too often, the instrument is made to act against itself.

We are told of cases where patients have been lifted upright; and it is common to see both hands used, even by men of some eminence. Such practice is outrageous; and is as unnecessary as it is dangerous. The necessity for so much force, is occasioned either by the instrument being incorrectly applied, or incorrectly constructed: much however depends on the judicious selection of a proper claw.

The claws should be exactly suited to the size of the tooth, and as will be seen by those described in the plate. That part which embraces the neck of the tooth should be made to fit, that it shall not touch at one place or point only, but as much as possible all along that side of the tooth; those for the bicuspidæ having simply a groove,* and those for the molares, two grooves with a point in the centre;† this point is intended to be

* Fig. 2.

† Fig. 1.

introduced between the two fangs, which prevents the claws from slipping, during the action of the instrument in extracting the tooth. The point also from this arrangement, if properly constructed, ought to be so managed that it will be beneath the decayed part of the tooth, even if the crown is almost destroyed. Claws made in this manner but rarely break off the crown.

Great care should be observed in the construction of the claw. The circle of it should be such, that no part of the crown of the tooth is, under any circumstances, capable of touching its under surface; the terminating portion of the claw only, being in apposition with the tooth. It is necessary that this should be strictly attended to; for every tooth, where the crown touches the inner surface of the claw, will most assuredly be broken, and the roots left in the alveolus. It is almost impossible to adapt a claw correctly, if the usual padding of lint or linen is wrapt round the bolster, as is done generally in the old instrument; it is also next to impossible for the operator to see what he is doing. With the instrument described in the plate, this padding is entirely superfluous.

The moveable bolster, when in apposition to the gum, retains its relative situation, and the fulcrum of the instrument moves upon it: this, I consider, one of the most important improvements of the key instrument: its superiority over the old one, is so evident, as to need no further explanation.*

In all the common key instruments, the claw is capable of being placed before the bolster for the purpose of removing the *dentes sapientiæ*, which was Mr. Spence's improvement; and behind the bolster, for the removal of the *bicuspides*, which was considered an improvement by Mr. Fox.

In those cases where it is necessary to remove the *dentes sapientiæ* outwards, as the ascending process of the jaw will frequently come so much forwards that it will project almost before the tooth to be removed, it will be evident that the bolster of the instrument cannot be placed in favourable contact with the claw: in such cases, the claw will be found useful before the bolster, and will in general act with precision and success.

* Fig. 3. The *moveable bolster* detached. Fig. 4. The *fulcrum* of the instrument. Fig. 5. The *screw* which retains the *bolster*.

It has been a question, whether lancing the gum is requisite; it is thought by many to be useless, and as adding to the fears of the patient, injurious: my own opinion is favourable to it.

Every one who has had much practice, must have seen innumerable cases where the tooth, after removal from the socket, was retained by a portion of the gum: this very frequently happens in the dentes sapientiæ, and the attachment is by no means so slight as would be imagined. As this is productive of some inconvenience, there seems no reason why that which must be detached should be torn, in preference to being separated by incision; particularly as many patients, so far from being intimidated at this preliminary, inquire whether the operator does not lance the gum; and requests that he will do so, under the impression that it assists the removal of the tooth. Besides which, it facilitates the insertion of the claw of the instrument. In fact, although the practice is not essential to the removal of the tooth, still it is of some utility; and as the pain which it gives to the patient is very trifling, there is, I think, no grounds for abandoning it when the key instrument is used.

In applying the key instrument, the power should be used gradually and with firmness: the fore finger of the left hand should remain on the claw, until the operator is certain it is properly placed, and his eye should be kept steadily on the gradual elevation of the tooth, in order that the rotation of the handle may be continued no longer than is requisite, as after the tooth is thoroughly detached from the alveolus, &c., it requires to be merely elevated perpendicularly; if this cannot be conveniently done with the key instrument, it saves the patient much pain to finish the operation by the forceps. Should the crown of the tooth break, leaving one or more of the fangs in the socket, they should be removed by the single or double elevator, instruments to be hereafter described.

After the removal of the tooth, the patient should be allowed to rinse the mouth with warm water, in which a small quantity of eau de cologne, or some pleasant aromatic, has been introduced; and when the bleeding has ceased, the edges of the gum may be pressed together. It is customary to introduce lint dipped in laudanum into the socket; this is

not only useless, but occasionally injurious. I have seen the gum heal over a portion of this lint which has been left in the socket, giving rise to the most troublesome fistulous abscesses.

In removing stumps, left either by the accidental fracture of the tooth in extraction, or in consequence of the total destruction of the crown by disease, it is requisite to use a double or single elevator. The double elevator which I use, is an instrument composed of two blades with spear points, turned at right angles with the handle of the instrument.

When considerable power is required to be used in removing the fangs of teeth, it is not only safer, but the power can be more favourably applied, when the adjoining tooth is made the fulcrum against which the instrument takes its purchase. This instrument is particularly useful in removing the *dentes sapientiæ* of the lower jaw when much decayed.

The application of the instrument, is simple. The points should be separated, and introduced one on each side between the tooth to be removed and the one adjoining. The handles should then be closed, and the points

pressed firmly down between the fang and the edge of the socket, the handles being depressed at the same time, when the tooth or fang will be easily raised out of the socket.

The single elevator, is an instrument formed simply of a piece of steel, set firmly in a handle large enough to suit the hand of the operator, with the point terminating in a shape similar to a small gouge, very sharp at the edge, and of well-tempered steel. The operator should be provided with two or three, the cutting edges of which should differ in breadth, to suit the size of the fang to be removed.

The instruments which I have described, are selected from among a large collection which I possess, and are sufficient to execute the generality of operations that come under the hands of the surgeon; at any rate an endless variety of others may be constructed from them according to the wants of the operator. Numerous plates would be requisite, to describe the many instruments which are to be found in my *boutique*; and would render the work too expensive for the generality of readers.

In order that every facility may be given to those who wish to possess any instruments similar to those in my collection, Mr. Weiss, (surgical instrument-maker, in the Strand,) is in possession of all my patterns; and from him professional men may obtain any they desire. This plan is necessary to ensure perfect correctness. An instrument may be good in itself, like Cartwright's forceps, but if the manufacturer does not possess the original pattern of the inventor, he too often produces a very imperfect instrument, possessing nothing but the name of its inventor to recommend it.

Although my instruments differ in many respects, from those used by the generality of dentists, and considerably exceed them in number, I should be sorry to arrogate to myself the superior intelligence assumed by a recent author, who states "that his apparatus, in consequence of its extent, and on account of its great difference from what is generally used, would not only *be dangerous in the hands of the ignorant*, but its judicious application would require some previous *practical*

instruction, even on the part of the scientific dentist."

Not being conscious of any such pre-eminent skill, I have no desire to assume it. I have no hesitation in asserting, that the ignorant will find my instrument less dangerous than those in common use; and I am quite ready to admit that scientific dentists may possess others of equal merit.

It will not be improper here to make a few remarks relative to the removal of the temporary teeth in children. For this purpose the forceps are sufficient with the occasional use of the small elevator. The natural yielding of the alveolar processes in the back teeth, and their slight attachment,—often more slight from the partial absorption of their roots,—render the child's key an instrument totally unnecessary. It is besides an instrument very awkward of application; and from the fears of the little patient may be attended with danger even in the most skilful hands. Young practitioners should abstain from its use under any circumstances.

In operating on children, it is most desirable

that as little time as possible should transpire between the moment when the operation is decided upon and its performance. The instruments, therefore, should be simple and easy of application, as the greatest obstacle to be met with in operating on children is their fear.

For the removal of the front teeth, a pair of straight forceps, with fine narrow-pointed nibs, and a pair slightly curved, is requisite. The molar teeth require forceps with broader nibs or chops.

Similar directions to those given when the forceps are used for the permanent set, are to be observed when the application of the forceps is required for the removal of the temporary teeth.

Where the crowns of the teeth are so much decayed as to render the use of the forceps inadmissible, a small elevator, used as in similar cases in the adult, will be found the most proper instrument for their removal.

Lancing the gum may at all times be dispensed with in children. It has a tendency to render the operation more formidable without a corresponding benefit.

ACCIDENTS OCCURRING FROM EXTRACTION
OF THE TEETH.

Although it is to be presumed that no serious accident can occur to a scientific dentist, still when it is considered that a part of the body is torn away by the application of a force which must be sufficient to overcome a very considerable degree of resistance, it will be evident that the extraction of a tooth is an operation of great responsibility. Many general practitioners have lost more reputation by an accident in extracting a tooth, than by the unfortunate termination of a labour. It is indeed surprising that a general practitioner will risk his reputation by performing, for one shilling, an operation, for which, if he would confess the truth, he has an utter aversion. This aversion, on the part of the medical man, frequently induces him to allow this important operation to be performed by his apprentice; or, in the country, if the patient be poor, he is picked up by the village barber or blacksmith, and he who has the strongest arm is too often the most approved operator. Could a perfect

catalogue be obtained of the accidents which have occurred to this class of operators, such an enumeration of broken and distorted jaws would be frightful. Unfortunately it is not to these practitioners alone that such accidents occur; they are met with by others of a more respectable description. Through the medium of my gratuitous practice, I have had opportunities of witnessing such cases beyond most men. When looking over my minute book, I find, amongst a number of others, the following cases, which will give some idea of the effects of the key instrument in the hands of the ignorant.—

A poor man, named Thomas Green, applied to a hair-dresser, famed for his skill in the art, to extract the first molar tooth on the right side; in doing which the alveolar process was fractured to the extent of three teeth. The bicuspid on one side to the dens sapientiæ, and the two anterior incisores, were pressed out of the socket with the shaft of the instrument. Before this case got well, the teeth, of which the processes had been fractured, became so loose as to render it necessary that they should be removed. The unfortunate patient, there-

fore, lost six teeth for his shilling (the barber's fee) instead of one.

A carpenter, named Thomas Dayly, applied to the apprentice of a country practitioner, to extract an upper canine. The key instrument was applied inwards; and, after several violent efforts, the tooth was removed. Inflammation ensued, extending over the face; the eyes were closed, the whole countenance presenting a frightful appearance, which continued until a large discharge of pus took place from an aperture in the palate behind the place from which the tooth had been removed. At this period the case came under my care. The inflammatory symptoms after a week somewhat subsided; but matter continued to flow in considerable quantities from the socket of the tooth. The three adjoining teeth became loose; the discharge became of the most offensive kind, and continued until a large piece of the inner plate of the maxillary bone, with the three teeth, exfoliated. This being removed, the poor man recovered, after suffering dreadfully for nearly three months.

A girl, twelve years of age, applied to an elderly gentleman in general practice, to

remove the first molar tooth of the permanent set on the right side. He commenced, with spectacles on nose; and, after several efforts, the tooth was displaced. The child, however, suffered all night excessively. Inflammation spread over the whole of the side of the face, and continued until an abscess formed. It was at this stage that the girl applied to me. At a proper period I evacuated the contents of the abscess, by a puncture inside the cheek. The inflammatory symptoms somewhat subsided; but an abundant discharge of fetid matter continued for some weeks to exude from the three different apertures in the jaw, until the gums retired, leaving a large portion of the jaw bare, which at length exfoliated with the two temporary molares and canine teeth upon it. The bone, when removed, exposed the pulps of the permanent set of teeth at the bottom of the sockets: these were soon thrown off, leaving nothing but a thin portion of the base of the jaw on that side. In three months the child got well; but was disfigured for life.

The worst case that ever came under my care was that of a farming man. He applied

to me, with a violently swelled face, accompanied with a highly offensive discharge of sanies from the mouth, produced by the exfoliation of a large portion of the lower jaw, extending from the anterior incisor to the ascending spine of the coronoid process. He stated that he had requested a medical man in the country to extract one of the teeth in the lower jaw. After applying the instrument, and using considerable force, the crown of the tooth was snapped off. A second, though unsuccessful attempt, was made to remove the stump, when the patient distinctly felt the jaw crack, and desired the operator to desist. He persisted, however, in another attempt, which was successful, but was followed by the most severe and excruciating pain, extending over the whole side of the face. On the following day, the face, eyes, and head, were highly tumefied, and the pain was intolerable. These symptoms continuing to increase in violence during several days, an abscess formed at the symphysis of the jaw, which pointed and burst externally. The orifice soon healed, and the matter passed into the mouth through several openings.

At this period I first saw him. Upon examining the mouth, I found a portion of bone, extending from the anterior incisor to the dens sapientiæ, and comprising the whole base of that side of the jaw, rapidly exfoliating. The mouth was horribly distorted, the integuments having retired from the portion of bone almost to its base; the whole being accompanied by a continual discharge of offensive matter, which mixing with the saliva continued running out of the corner of the mouth.

In six weeks the bone became sufficiently loose to be readily removed. I directed for his mouth the frequent use of lotions of infusion of roses, with borax and tincture of myrrh. Healthy granulations were observable, and the part near the symphysis soon healed. A considerable discharge was still kept up from two different sinuses at the posterior part of the jaw; these were dilated into one, and injections of diluted nitro muriatic acid were constantly used. During the following week two smaller pieces of bone were extracted, and the whole of the left side of the jaw, from the symphysis to the angle of the base, being now removed, mas-

tication was performed in a very imperfect manner on the healthy side.

As the parts gradually healed, a substance of cartilaginous consistence could be distinctly felt, situated between the divided ends of the bone at its base. The head was now bound up, so that the remaining parts of the jaw might be kept, as nearly as possible, in their natural situation; and the former lotion with infusion of roses was substituted for the acidulous one. The substance between the ends of the bone gradually increased in size and firmness, and in a fortnight the cavity between the fracture was nearly filled up. The two ends being firmly united, mastication was performed on the healthy side, with scarcely any inconvenience. The discharge soon ceased, and the patient perfectly recovered. The deformity of the countenance was very trifling, being scarcely perceptible.

One peculiarity in this case was, the rapidity with which nature effected the processes of exfoliation and reproduction.

It may be proper to mention, before I conclude these observations, that almost all the

cases described were seen by surgeons of eminence, or by those medical gentlemen who live in the immediate vicinity of my own residence.

These cases, with many others, were among my gratuitous patients. The next which I shall describe, occurred to a young lady with a very beautiful set of teeth. Being afflicted with pain in a molar tooth, she went to a medical man, for the purpose of having it removed. He, however, was from home, and the assistant proffered his services, which were accepted. The operation was performed, according to the lady's description, with so sudden a jerk as to throw the tooth against the ceiling at the opposite side of the room, and accompanied by so violent a crash as to convince her that the jaw was fractured. During the night she experienced dreadful pain. Inflammation came on, extending over the whole face, closing the eye, and frightfully distorting a previously beautiful countenance. I was now called in. An immense abscess formed, from which the matter was allowed to escape by puncturing the inner part of the cheek. After the inflammatory symptoms had somewhat subsided, and

the mouth could be a little opened, I found it necessary to remove the second molar tooth and the bicuspides, which were loose, and from the necks of which matter exuded in large quantities. Abscesses continued to form from time to time during eight months, without the bone becoming detached. The constitution at length gave way under the extensive discharge which took place, and which must have passed into the stomach in large quantities. The young lady went out of town for a month, and on her return she stated that another formation of matter had taken place, which had unfortunately been allowed to burst externally, leaving a large scar on the cheek. The bone, with the other bicuspid tooth, now became detached, leaving the dens sapientiæ without support, which were in consequence removed: the patient then recovered, and the vacancy was supplied artificially.

In this case a young and lovely female, possessing with the exception of one, a fine and perfect set of teeth, was deprived, by the unskilfulness of an inexperienced operator, of five teeth and a large portion of the jaw—became disfigured by a scar on the cheek, and was sub-

jected to twelve months of disease and suffering.

These and numberless other cases of accident from the use of the key instrument, have come under my care. In every instance in which I have had an opportunity of examining the instrument which occasioned the accident, I have ascertained that it has been caused by using too large a claw. Selecting a suitable claw is often disregarded altogether. Padding the bolster, is a very imperfect method, and renders the operation very uncertain. The operator should ascertain at once whether the instrument which he is about to use, is a proper one; for if it is not, he has a great chance of being unsuccessful, and at all events will give the patient ten times more pain than necessary. If the claw is too large, a fracture of the alveoli, of more or less extent, is to be dreaded. If on the contrary it is too small and the tooth very firm, he may exert his whole strength without accomplishing his object; and most probably either the crown of the tooth will be broken off, or some part of the instrument will give way. A very small force is required to remove even the largest

teeth, when that force is properly applied. No really scientific man will ever meet with an accident, except that of breaking off the crown of a tooth or a small portion of the alveolar process; and this will occur but seldom, if the key instrument represented in this work be employed.

Accidents from the forceps are very rare, if those instruments are well made, judiciously chosen, and used with steady confidence; and I am acquainted with only a single instance of any more serious than the breaking of a tooth. I once saw a bicuspid that had been forced out of the socket by one of Mr. Fays' forceps, in attempting to extract the first molar tooth; the piece of wood being placed on the bicuspid.

The common punch is a most unscientific and dangerous instrument. I have seen two accidents of the worst description arising from its use.

A poor man applied to me, about three years since, with a defective palate. Upon my inquiring the cause, he stated that a gentleman in the country had attempted to extract the root of the last grinder in the upper

jaw : after using considerable force, the instrument slipped, and the point stuck fast into the roof of the mouth, so that he had been ill with it for six weeks, until a portion of bone exfoliated, leaving a circular aperture through into the nose. The other case was that of a girl who applied to a noted barber, to have the stump of one of the *dentes sapientiæ* of the lower jaw removed ; in doing which the instrument slipped at the moment the operator was applying his utmost force, and the point went through the cheek. Before the cheek got well, the girl came to me, as a gratuitous patient, to have the same stumps removed. This I performed, and she came occasionally afterwards. For a considerable time the inflammatory symptoms continued, and the saliva passed out through the aperture. Ultimately the inflammation subsided, the opening healed, and the patient felt no further inconvenience.

Should a tooth be broken, it is always advisable that the operator should at once extract the stumps. I have occasionally met with practitioners who have asserted that they have never broken a tooth. Such men either speak untruly, or the number of their operations

has been very limited. The most able operator with the best constructed instruments, will occasionally meet with this accident. When it occurs, the operator must not lose his confidence, as too commonly happens, but must immediately proceed to remove the stumps. A patient will always go away dissatisfied, if the stumps are allowed to remain; and although he may suffer more pain in the operation than was anticipated, still if the mouth is divested of the tooth, he will generally consider it a sufficient recompense.

Where a portion of the alveolar process is fractured, and does not come away with the tooth, it should always be removed, or the patient is likely to have a sore mouth, with an offensive discharge, which may possibly continue for weeks. In such cases also patients are very apt to say that their jaw is broken: an assertion not calculated to advance the operator's reputation.

Two teeth may be removed instead of one, from their being united. The occurrence of this union of two teeth has been denied by a late author; but the fact does not rest upon mere assertion. Mr. Bell has several specimens

of teeth united. My own museum contains three specimens; two bicuspides, two incisors in the lower jaw, and two front incisors in the upper jaw. These teeth were evidently formed at the same time. I have seen several other cases, some of which have been temporary teeth. The two lower incisors which I possess, are of this description. I observed and watched them when they first passed through the gum, and eventually I removed them when the shedding of the teeth took place. These cases are, I confess, of rare occurrence; but that they do occur is well testified by the above specimens, which will at once set aside mere assertions to the contrary.

HEMORRHAGE AFTER EXTRACTION.

It is a well known fact that there are certain families, the members of which are all disposed to violent hemorrhage upon the slightest occasion. I have in my own practice met with patients who have had several teeth removed, and suffered from hemorrhage with each. There are also certain states of the constitution

which predisposes to hemorrhage at particular periods.

Hemorrhage is not to be attributed to the unskilful performance of the operation. It will frequently follow when scarcely any force has been applied. The most remarkable case of this kind which I have met with, was that of an elderly gentleman who had but one tooth, a bicuspid which was extremely loose, and which had produced in consequence considerable inflammation in the gum. He at length requested his medical attendant to remove it, which was done with very trifling force. Hemorrhage followed, which no applications or pressure would stay. At the end of a week, either from loss of blood or some other cause, the patient died, the bleeding having continued without intermission until his death.

A variety of methods are recommended for the treatment of hemorrhage occurring after the removal of a tooth, and among them the use of various styptics, such as alum, turpentine, muriate of iron, cuprum, and others, none of which can be depended upon. Pressure, well directed, is the only remedy that can be confided in. There are, however, many cases where even

this is of no avail. Pressure may be made in various ways: the most certain is to clear out the socket, from which the hemorrhage arises, from coagulum, and with a long strip of lint plug it up from the bottom, pressing the lint firmly in with a stopping instrument. When the whole of the socket is well filled, place a small compress of linen over all, and direct the patient to close the upper teeth upon it. This will generally succeed ; but cases occur requiring some variation of this method. The patient may be a child, or a maniac. In the former case it becomes necessary for the professional man or nurse to make the pressure upon the compress with the thumb, continuing to do so until a coagulum is formed and the mouth of the vessel contracts.

The latter case is one of much greater difficulty. I once met with a most troublesome patient of this kind. A gentleman, a perfect maniac, was brought to me, attended by his keeper, to have a tooth removed. The operation was performed and the unhappy man bore it very quietly. In the evening I was sent for by the friends of the patient to stop the bleeding, which had continued. It appeared they could

not prevent him from sucking the gum. He had lost a considerable quantity of blood, and it was then literally running in a stream from the socket. He had also become so violent as to render it necessary to put on the waistcoat. He would allow nothing to be done, and it was dangerous to expose the fingers to his mouth from his efforts to bite. As, however, it was essential that the bleeding should be stopped, I was at length obliged to place an iron gag in his mouth to enable me to stop the socket, and finally to place a piece of hard wood across the mouth over the compress, which was tied under the chin and round the back of the head. This was kept in the mouth until the following day; he then became calm, the gag was removed and the bleeding had ceased.

EXCISION OF THE TEETH.

The crown of a tooth when carious is sometimes removed by excision, an operation which it has been pretended is more eligible than extraction; because, while it relieves the patient from pain, it preserves the form of the

mouth, and retains the dental circle by preventing the absorption of the sockets. This operation has been recently brought into notice by an American practitioner, who claimed to be the inventor of some instruments for its proper performance; but the claim, like many similar ones, is unfounded. Excision is recommended by the old authors, in whose works diagrams of the excising forceps will be found not unlike those of the present day, except in being straight instead of curved. It is, however, an operation deserving to be noticed, only for the purpose of warning the student from being misled by bold but delusive assertions of its utility. With this view I shall offer a few remarks dissuasive from so injurious and unscientific an operation. Its advocates must have formed extravagant conceptions of the credulity of their professional brethren before they ventured upon such assertions as the following:—"That the openings by which the minute canals terminate in the common cavity become, soon after the excision of the crown, plugged up with bony matter, which thus affords a permanent protection to the interior of the stump." A convert

to this new practice assured me, that the membrane lining the inner cavity of the tooth, was very generally plucked out altogether at the time of the excision of the crown, rendering the crown no longer sensible. He might have added—and becoming an extraneous body, like a pea in an issue, producing constant inflammation in the surrounding parts, which can only be subdued by the removal of the stumps. That teeth may have had their crowns removed without giving pain to the patient either at the time or afterwards is true; and it is by no means uncommon to find the internal cavity of a tooth so nearly obliterated, that the finest hair could not be inserted where that cavity originally was; but this has been a work of years. That the aperture was ever filled up by the wounded membrane after the operation of excision, no one at all acquainted with its structure and character will be ready to believe, any more than he can admit the practicability of plucking out the internal membrane by cutting off the crown of the tooth from the internal part, to which the membrane has but the slightest possible degree of adhesion; whilst at the apex of the fang where it has its origin, it

finds as it were a sheath for the artery, vein, and nerve, which ramify upon its surface, and where it would of course require some considerable degree of force to separate it. But even asserting the facts to be as stated, still the operation is clumsy and unscientific. It is at best exchanging carious teeth for stumps; the inconvenience from which frequently becomes intolerable. The injurious consequences resulting from allowing the stumps of teeth to remain in the mouth, are too frequently exemplified by cases of the most obscure yet distressing kind, which come under the care of the physician and surgeon—cases which can only be effectually relieved by the removal of the stumps,—to need any further remark on my part.

The practice had its day, but it has declined since the case of lock-jaw occurred in consequence of performing the operation upon the teeth of a lady. The case terminated fatally, which somewhat damped the ardour of the advocates of excision, and allowed reason and science to resume their influence.

If excision can in any case be defended, it will be in its application to the front teeth

where other teeth are to be pivoted instead of removing the crowns by drawing or filing, an operation exceedingly tedious and painful: excision deserves the preference. Here it is important to retain the stumps as long as possible. In all other cases the patient would be a gainer by their removal.

THE

DENTAL MIRROR.

CASES often occur in which it is impossible to obtain a satisfactory view by merely looking into the mouth, and the assistance of a small mirror becomes necessary. The mirrors sold for the use of dentists, consist of a piece of looking glass somewhat less in size than a half-crown, but of an oval shape; the glass is set in a silver casing, which is rendered moveable by two central pivots, or has a double hinge, one for the purpose of depressing or elevating the glass, the other attaching a handle of two inches in length to the glass frame, used for shutting the glass, frame, and handle together, for the purpose of rendering it more portable. These mirrors have always appeared to me to be very

contemptible instruments; they are too small, and I have seldom seen one which gives a good representation. The glass very generally gets slightly loose in the frame, and the silver at the back soon gets rubbed off. In addition to these defects, they seldom sufficiently magnify the object, which is frequently an important point.

The mirrors which I have been in the habit of using, are different, in several important particulars, from all others that I have seen—different in material, in shape, and in concavity. They are composed of steel, polished by a lap to the highest degree of which it is capable, being almost black in colour: they are of various shapes, and of various degrees of concavity, that the object may be viewed in any situation and be magnified to any reasonable size.

The superiority of steel over glass, admits of no dispute, whether we regard the clearness with which the object is delineated, its property of retaining unaltered that clearness, the extreme durability of the article, or the possibility of making the instrument of any shape. One thing must be remembered—it is necessary to warm the mirror before putting it to the mouth;

if this is done, the breath, which is so troublesome on a glass mirror, will not affect the surface of the steel, which is another important advantage.

It would be tedious to describe the various shapes of the mirrors which I have had made, in order to enable me to obtain a view of the mouth, in any situation: three, of different magnifying powers, will be sufficient. It is somewhat difficult to get them well made: the steel must be of the very best kind, and the workman's lap must be in the very best order, or they will, after awhile, become cloudy; but when well made they will with a little attention, continue in uninterruptedly good order for many years. Care should be taken not to put them away damp. Should this be neglected, and the mirror allowed to become dull, it will be necessary to have it relapped, and it will then become as perfect as when new. These mirrors may be made with a hinge, like glass ones, or the shank part may be bent to the exact figure required. By the latter method they may be made lighter, which gives them a more elegant appearance.

A good dental mirror is often of the utmost importance. When caries is situated at the back part of the dentes sapientiæ, it would be impossible, without the use of a mirror, either to stop the tooth properly, or to file out the caries; and even other teeth, not situated so far back in the mouth, when diseased at their posterior part, could not be operated upon effectually without such assistance.

If such mirrors were more frequently employed, patients would not be found complaining as is now very generally the case, of the roughness which remains after the tartar has been removed from the teeth. This roughness will continue for some time upon the back part of the incisores, producing a very disagreeable sensation, and forming a nucleus for a further disposition of tartar. By the help of a strongly magnifying mirror, the dentist may be enabled to remove even the minutest particles of extraneous matter, rendering the teeth smooth, and the patient comfortable.

OF THE USE OF THE FILE.

Though filing the teeth is apparently a simple operation, it is one which requires considerable care. When performed unskilfully, or without the scientific discrimination necessary to form a judgment as to the propriety of its use, more injury is frequently done to the sound part, and to the adjoining tooth, than would have ensued from allowing the disease to take its course. When, however, it is skilfully used at a certain stage of disease, the file is one of the most valuable instruments in the '*boutique*' of the dentist.

It is certainly a matter of some delicacy to determine when the caries should be removed by filing, and when it would be better to have recourse to stopping the teeth. Dentists are too much in the habit of using the file indiscriminately, for superficial and deeply seated caries. A considerable portion of the sound part of a tooth is frequently taken away merely for the purpose of eradicating some discoloured spot of incipient caries. It may be laid down as a general rule, that whenever the disease has

penetrated the substance of the tooth to such a depth that it will retain a sufficient quantity of gold with certainty, the use of the file should be avoided, and the aperture should be cleaned and stopped. In such a case, although the diseased part might be removed by filing, the operation would leave so large a healthy surface exposed, divested of its enamel, that the tooth would inevitably fall a victim to some of the numerous causes which produce inflammation of the bony structure. I have frequently seen a large molar tooth cut half away with a half-round file, to eradicate a diseased spot which was situated between two teeth. The extensive surface of healthy bone thus laid open, was for some time after exquisitely tender, and the teeth thus treated eventually became diseased over the whole surface that had been subject to the file. I may here notice an injurious practice adopted by some dentists of cauterizing the surface left exposed, for the avowed purpose of destroying sensibility. This indeed it effects instantaneously; but the consequence, most undoubtedly, is a death of the part to a greater or less extent of depth. Where the abuse of the file has occasioned

mischief, and the patient suffers much from the tenderness of the part, the application of spirit of wine for a short time, will generally afford relief.

The file is often used most indiscreetly, for correcting irregularity, and the health and solidity of the teeth sacrificed to the beauty of arrangement. Regularity is indeed desirable but the use of the file is seldom the safest method of promoting it. When, by its application, the enamel would be removed, and the bony surface exposed, the desired object must be attained by other means, or permanent injury will be the consequence. The time of its appearance may be remote, but its arrival is certain. Aware of this, the dentist should bear in mind, that the pleasure of affording present satisfaction will not compensate for the mortification of having his patient return to him at some future period, complaining that the teeth thus treated, have been sacrificed by his want of knowledge, or want of principle.

The method of using the file, in separating teeth, requires the most careful attention. I have frequently seen teeth, after they had been separated by some careless operator, that have

made me feel ashamed of the profession to which I belong. Instead of first carrying the thinnest file down with care and precision, a thick file has been used in the most awkward and crooked manner, half as much more being taken from one tooth than from the other, and not unfrequently, a deep notch left in the posterior surface of the body of the tooth so mutilated. I have often, indeed, seen patients who have lost all the four front teeth, by the improper use of the file in early life. I shall now pass to the legitimate use of this instrument.

In treating of the use of the file, when employed in the cure of disease, we may consider it—*First*, as a principal, were the use of the file is of itself capable of eradicating the disease without further assistance—*Secondly*, as an auxiliary, where it is used to assist in the performance of an operation. The general rule which I have laid down, as to the proper period for using the file, I believe to be a good one, but in its application, much must depend on the discrimination of the operator. Cases will continually occur, in which no rule, unassisted by experience, will be able to determine the proper course to be pursued. With

a view to assist the judgment of the youthful practitioner, I shall enter into some details which (if I may judge from the thirst felt by myself, at an early age, for information founded on practice,) will not, by those for whose use they are intended, be considered unnecessarily minute.

I shall take each class of teeth in succession, beginning with the incisores ;—These teeth are found most generally affected with caries in three situations—anteriorly, posteriorly, and laterally. When it occurs on the anterior surface, it is generally near the neck, in an aperture of an indefinite shape, and more or less deeply seated. When seated posteriorly, it is generally at the bottom of the concavity, just before the tooth becomes bulbous. But when laterally between two teeth, both of them are for the most part affected in a similar manner.

When caries having affected the anterior surface of a tooth, has made its way through the enamel, and decomposition of the bone has commenced, but has not proceeded to any considerable depth, the aperture being of an irregular shape, and having more the appear-

ance of an abraded surface than a circular hole, the file may be used with success.

The operator must, before he commences, be certain that he is about to employ the best remedy for the disease; for, should he find, after using the file, that the caries is more deeply seated than he at first supposed, and consequently be obliged to leave the operation half finished, or what would be as bad, leave the cavity so exposed that inflammation would ensue, he had much better have left the tooth as it was; for if after the file has been used to a certain extent, stopping be found to be preferable, it will then be too late, as the aperture is spoiled for retaining the gold in a proper manner. The carious cavity, therefore, should be previously examined with an appropriate instrument, and its depth ascertained. If found to be superficial, it should be filed out, care being taken to destroy as little of the surrounding healthy substance as possible. The diseased portion must be removed in the most perfect manner, so that not the slightest vestige may remain; for should the smallest particle of dead matter be left, it will soon become the cause of farther decay. The

diseased part having been thoroughly filed out, the surface of the bone should not be left rough, but should be finished, either with a very smooth file or a sharp scraper. Caries, at the anterior neck of the teeth, will often penetrate underneath the gum; when this is the case, especial care must be taken that the whole of the dead part is removed. Frequently the gum will be found inflamed over the carious cavity, sometimes so much so as almost to cover it.

When this occurs, rather than not eradicate the caries, and finish the operation in a perfect manner, the portion of inflamed gum, covering the disease, should be removed. The bleeding will be found serviceable, and the gum will, by proper treatment, soon be restored to health.

In many cases, the caries will be of unequal depths, and after an extensive diseased surface has been removed, there will be a single spot remaining in the centre. Here it would be folly to continue to use the file, to the destruction of the adjacent sound parts, as the spot may be removed by an instrument like a very fine gouge, made of the best steel and very sharp. The operator should be supplied with

various kinds of these instruments of different shapes and sizes. [See Fig. 11.]

He must be careful also to provide himself with a suitable collection of files. The common flat, round, and half-round files, sold in the shops for the use of dentists, form but a very small part of those which are requisite. They must be obtained of every variety of shape, and degree of smoothness.

Where superficial caries is situated at the posterior surface of an incisor, files of the common construction are inapplicable. For this situation, files are required shaped in the segment of a circle; the segments being of different sizes. These may be used for the removal of the enamel, and the little gouge-shaped cutting instruments for finishing the operation, as they will in most cases do it more perfectly than the file.

In the removal of lateral caries when situated between the sides of the incisores, considerable management in the use of the file, is requisite: and in the performance of this operation, a dentist has an opportunity of displaying his skill, by exterminating the disease without injuring the beauty of the teeth.

When the diseased part is merely a dark spot equally divided on the lateral surface of each of the teeth, it will be sufficient to pass a flat file of a suitable size, cutting on both sides, between the two teeth, until the discoloured part is removed. But when the caries is more deeply seated, and has penetrated through the enamel into the bony structure of the tooth, a more complex treatment becomes necessary: the file is then used as an auxiliary. Where the teeth are so closely situated that it is not possible to pass an instrument between them to ascertain the extent of the disease, the first part of the treatment, viz. filing must be so managed that the teeth should be left in a fit state for the operation of stopping, should the depth of the aperture render it necessary. A thin file, cutting on one flat surface only, should be first used. The file, if properly used, will expose the diseased surface at the posterior part; and after a sufficient quantity is removed in this manner, the operator must ascertain whether it will be prudent to continue the use of the file, or terminate the operation by the sharp cutting instruments before mentioned. If the teeth stand much apart from each other, a thin half-round file, but slightly

convex, may often be used with success; but when they are very close to each other, this cannot be used, and it is then better to resort to the cutting instruments. These instruments should be twisted in different shapes, and their cutting edges should be capable of being used four different ways—from the operator, towards him, laterally from left to right, and from right to left. Without this variety they will frequently be useless, as the decayed surface may be so situated that a single instrument, cutting in one way only, will not touch it. Having completely removed the diseased portion from the posterior part of the tooth, a fine scraper, with a little water, should be used, that there may be no roughness left. Should the tooth have been at all disfigured by the application of the file, this should now be corrected. A similar treatment should also be adopted with the tooth adjoining, when it is similarly diseased. It is frequently difficult to obtain a file that will cut away the caries without injuring the adjoining tooth. Under such circumstances the operator must have to supply the deficiency, and as every dentist is presumed to be a good mechanic, and to have every thing suitable for the exer-

cise of this part of his profession, he has only to take off the cutting surface of the file, at any part where its removal is desirable. In fact, however good a collection of instruments a dentist may possess, he will occasionally find it requisite to alter one, to suit some particular case, unless he is satisfied with a slovenly and imperfect mode of operation, disreputable to himself, and injurious to the patient.—The practitioner should never suffer himself to forget that his patients have a right to the advantage of all his professional knowledge and dexterity, and that if he neglects to give them the full benefit of both, he is acquiring emoluments to which he is not entitled.

Some members of the profession may not acquiesce in the necessity of so great a variety of instruments, they having been in practice for years, and finding it difficult, perhaps, to number two dozen. Disclaiming any intention of traducing the character of the profession, and acknowledging with pride as well as with pleasure that a considerable portion of its members are able and intelligent men, I cannot but lament that the stock of

instruments provided for their use, is so imperfect as to render ability and intelligence in many cases unavailing. When I first commenced practice and possessed only the limited number which are to be purchased under the name of dentists' instruments, I found that I was not prepared for half the operations required; that with such imperfect assistance they must in many instances be performed most miserably, and that in many others they could not be performed at all. To supply the obvious deficiency of proper instruments and to provide myself with the means of performing every operation in the most perfect manner possible, I was led to construct all the varieties which I possess; and each individual instrument has been added as experience and reflection have suggested its necessity or usefulness.

Caries of the canine teeth is generally to be found situated either at the anterior part of the neck of the tooth (and this more particularly in the lower jaw,) or at the lateral surface between the teeth, frequently close under the gums. Much of the beauty of the mouth depends upon the cuspidati. To become sensible of their importance, we need only observe

the appearance of those persons who have been deprived of one or both of them in early life, through the ignorance of some operator, who, when these teeth have been out of their situation, has removed them under the impression of correcting irregularity. The mouth wanting these important teeth, will appear ugly and contracted. The greatest care should consequently be taken to prevent their premature loss, as well as to avoid disfiguring them by any awkward application of the file. The situation of the canine tooth renders it the most convenient of the whole set for the use of the file for caries on its anterior part; and owing to the obtuseness of its crown, it will bear a larger portion removed from the posterior part than an incisor when the disease is situated between the teeth. The treatment must be similar to that laid down for the incisors, taking especial care not to injure the adjoining tooth whilst operating upon the carious one.

In the bicuspidetes decay most frequently takes place on their lateral surfaces; and when the teeth lie close to each other, it is extremely difficult to ascertain the extent of the caries,

and consequently to know whether filing or stopping should be resorted to.

The bicuspidés, like the incisores, are very generally diseased in pairs, the same cause of decay acting equally on both teeth, viz. lateral pressure displacing the striated fibres of the enamel, and producing a death of the bone beneath to a greater or less extent; but, unlike the incisores, they are not favourably shaped for the removal of caries with the file without altering their appearance. This, however, must be sacrificed to their safety. But in these teeth, when thus diseased, there is some difficulty attending the operation of filing, as a very considerable portion of the healthy part will be removed in eradicating a small caries unless the file is used with great discretion. It is seldom indeed that application is made to the dentist until the disease has proceeded too far to admit of its removal by filing; but where the carious spot is superficial, a flat file cutting on one side only, if the adjoining tooth be not diseased (on both sides if it be diseased) should be passed between the teeth. If this does not eradicate the carious spot, a file slightly convex must be used until the object is attained. If

the file is used dexterously, the caries may often be cleared away without removing any of the anterior part of the tooth.

The molar teeth, from the great extent of their crowns, are attacked with caries in different situations, the more frequent of which are four in number:—in the central depression of the grinding surface; at the neck of the tooth; at the anterior surface between the central notch; and between the teeth. Of these the first and last are the more common. When an incipient caries is observed in the central depression of a molar tooth, it is often impossible to cut it away with a file, neither can it be properly removed with cutting instruments; since however well they may be tempered, they will be found to make but slow progress when used against enamel:—they are useful only for cutting the bony part of the tooth when the enamel is removed. For eradicating a carious spot thus situated it is requisite to use an instrument of a different description; and as it is one not to be obtained at the shops, I have considered it requisite to give a diagram of it. [*See Plate of Instruments for Caries, fig. 2.*] It consists of a long round shank, terminating in

a bulbous head, which must be cut with eight edges, exactly similar to those instruments used by dentists called cutters, which are attached to the lathe for rough fitting a block of sea-horse. These instruments must be of various sizes; the bulbous head of the smallest must not be larger than the head of a common sized pin, and the size must gradually increase through a series of a dozen instruments. These are the most useful instruments that can be employed for the extermination of caries when the enamel only is affected, and where the disease is situated disadvantageously for the use of the file; indeed they are a species of file, which is the reason why they are mentioned in this place: they are to be used by placing the bulbous head against the diseased spot and turning the handle round. The shank of the instrument must be a little curved for some situations, varying the curve as the situation of the decay may demand. In many cases the tooth is found to be dark coloured, and has all the appearance of being considerably diseased internally, although the diseased part may be almost covered with enamel, which is only somewhat more discoloured than the

rest of the tooth; and this may occur in so awkward a situation that neither the file nor any other common instrument can be used successfully. These cutters will here be found of the greatest use. The disease may be eradicated if it does not go beyond the enamel; or if after penetrating through this substance, the bone is found considerably decomposed, the aperture left by the cutter is precisely the most convenient one for stopping, should that operation be found necessary. When, therefore, a caries is situated in a molar tooth, as before described, it should, if superficial, be eradicated with one or other of these cutters; and after the spot is satisfactorily removed, the hole must not be left in this state: a larger instrument must be introduced until the aperture is formed into the shape of a shallow bason, so that it would be incapable of retaining any extraneous body which might pass into it during mastication. Where the disease is situated between the teeth or on the anterior surface, as before described, files of various descriptions must be used. As the situation of the molar teeth is unfavourable for the operator, it is necessary to have an instrument for carrying the file without

introducing the fingers into the mouth. This instrument is termed a file-carrier. The operator should possess two or three varieties of them. With this file-carrier, even the back of the dens sapientiæ may be filed, should it be requisite. That the apparatus may be complete, the files should be made short and exactly to fit the carrier. To ensure this the dentist need only give a direction to a file maker, or any one else of whom he may purchase, to supply him with files after a certain pattern.

In whatever part of the tooth the caries may be situated, its extermination should be accomplished after the manner described. Trifling variations in situation and circumstances will frequently arise, and these must be met by the skill and ingenuity of the operator; remembering at all times that if he depends upon the stock of the instrument-makers for the requisite means of performing the various operations the teeth require, he will constantly have occasion to regret the insufficiency of the "matériel" of his profession.

STOPPING.

The operation of stopping, or plugging, is employed for supplying any portion of a tooth which may have been destroyed by the disease called caries, or gangrene. It is also intended to prevent the farther extension of the disease.

Stopping teeth is an operation of very ancient date, as has been stated in a former part of this work; it having been used as a remedy for disease, as well as for the purpose of filling up cavities, if very large, in order to assist in the safe extraction of the tooth when that operation became necessary.

There is no subject connected with dental surgery of more importance than that of stopping. There is none better deserving the attention of the student, nor is there any in which the dentist may more successfully display his professional skill. Were we to judge indeed from the almost innumerable cases of failure which occur, we might conclude that the uncertainty of the operation was so great as essentially to diminish its utility and importance. These cases, however, generally occur

under the management of ignorant persons, who are alike incompetent, to the mechanical and the surgical part of the operation, and who are equally incapable of choosing a proper time for its performance.

It would be both illiberal and unjust to cast a general imputation on the profession, and inasmuch as it is my own it would be foolish; but it must with pain be confessed that there is no profession which contains so many persons grossly ignorant of the principles of their art as are to be found among dentists. No other profession presents such a heterogenous mixture of information and ignorance. It is no unusual thing for the workmen of eminent dentists—men who are mere mechanics—to commence practice and challenge public confidence by using the names of their former employers, to whom they state themselves to have been assistants. Many of these men have been originally jewellers, watchmakers, or ivory turners; and in some instances even the coachmen and footmen of celebrated dentists have taken up the profession of their masters.

It would be well if this motley group of professors confined their labours to the making of

artificial teeth; but unfortunately this is a field too narrow for their ambition and their essay to perform operations. For there they of course possess neither scientific knowledge nor manual skill. The majority of the various species of operations, they have never even seen performed by their former employers; and if they at length acquire a degree of mechanical dexterity, it is obtained by experiments made at the expense of the unfortunate persons who become their patients. Who need not feel surprised that such men should continually fail in performing operations which distinctly belong to the surgeon-dentist, a title which in truth belongs of right to very few, though in the present day it dignifies every one who chooses to assume it. It is true that mechanical skill is essential to a dentist; but this alone is by no means sufficient. It is the union of surgical with mechanical knowledge which constitutes the accomplished practitioner.

In stopping teeth it should always be remembered that there is no medium between complete success and the total want of it. If disease is not perfectly eradicated, the operation is in point of fact a failure. It is but

~~1st~~ 1st ref - to infect
2^d death if intended in our
present day - 154 meaning - 2^d

procrastinating a little the destruction of the infected tooth; and too often by suffering it to remain in the vicinity of healthy ones, involving them in its fate. The operation is at best one of considerable uncertainty. However early the diseased tooth may come under the care of the dentist; however judiciously it may be stopped, no one can predict with confidence that it shall not fall into decay at some other part, or at several parts, at various periods after the operation: of this every one who understands the physiology and pathology of the teeth must be aware. Allowing for the uncertainty which must ever attend the operation, its success will be found to depend mainly on attention to the following circumstances:—the healthy or unhealthy state of the mouth generally; the greater or less extent of the diseased part; the existence of sufficient vitality in the tooth, or the want of it; the proper period for performing the operation, and the skilful performance of it when determined on. If these points were at all times attended to, it is probable that the number of teeth stopped would be diminished by three-fourths.

Previous to entering on the operation itself,

it will be proper to advert to some of the preliminaries essential to its success. The first of these is a healthy state of the mouth generally, without which the operation will be inevitably unsuccessful. For instance, if a molar tooth be carious, however favourable may be the circumstances of the individual tooth, though the aperture may be conveniently situated for the operation, and though no pain should be felt by the patient when pressure is made in the cavity, still it would be injudicious to stop the tooth should the gums surrounding it be kept in an inflamed state by any irritating cause, such as old stumps, ill-constructed artificial teeth, mercury, or derangement of the stomach. If the tooth be stopped under such circumstances, the disease will go on just as before; the aperture will consequently increase in size, and the stopping no longer fitting, it will come away; severe tooth-ache will probably ensue and extraction will become necessary; and thus the patient will be deprived of a tooth, which, by a proper line of treatment, might have been preserved perhaps to the end of his life. It must ever be borne in mind that to ensure success, the first requisite is to have

the mouth in a healthy state ; and if it be not, it must be rendered so by a judicious course of treatment previous to the performance of the operation. The next subject for consideration is the extent of the disease, for the purpose of ascertaining whether stopping is the proper remedy ; and if so, whether the tooth is in a proper state to bear the mechanical power required by the operation ; or whether a previous surgical treatment of the membrane lining the internal cavity of the diseased tooth is necessary. In the chapter on the use of the file the circumstances have been pointed out under which that instrument should be employed in preference to stopping, and also those under which it is useful as an auxiliary in the performance of that operation. When stopping appears advisable, the first thing is to introduce a pointed instrument into the carious part ; and should no tenderness be complained of by the patient, it may be at once concluded that mechanical assistance alone is requisite. On the contrary, should the tooth be tender on the touch of the instrument, it may with equal promptness and certainty be concluded that the membrane lining the cavity is more or less

exposed or injured by disease. The operator must now determine whether he can safely and successfully have recourse to stopping, or whether it is not his duty, both as regards himself and his patient, to recommend the removal of the tooth at once. Frequently the tenderness is so slight that the careful eradication of every portion of the decayed part will be sufficient to remove it, and the tooth may then be stopped with a reasonable expectation of success. But when the tenderness is great, the tooth must be treated as will be hereafter described. In treating of the operation of stopping it will be necessary to consider what is the best material to be used for the purpose, and then what are the proper instruments for performing the operation.

Amongst the numberless things which have been proposed for stopping teeth, there is only one perfectly suitable, and that is gold: but as the public have been given to understand that there are newly invented cements capable of effecting all that is desirable in curing tooth-ache, plugging up carious cavities, and permanently stopping the progress of disease; and one advertising practitioner has gone so far as

to promise to re-enamel the teeth with cement, it will be proper to make a few remarks on the subject without proceeding farther.

CEMENTS.

From the earliest ages we find cements used for the purpose of restoring teeth which had fallen into decay. Many of those employed by the ancients were both ridiculous and faulty. There were others of a better kind, composed, like many in the present day, either of mastics dissolved in spirits or of materials analagous to plaster of Paris. In fact, in this, as in most other parts of our profession, modern times have produced little that is really new, notwithstanding the pompous announcements of every day's newspaper. Few things are more mortifying to the well-informed practitioner than to find his patients leaving him to place themselves under the care of one or other of these puffing pretenders of the day, who are very generally men who have risen from the lowest grades of society, and whose only talent

lies in practising on the credulity of mankind. The cements now in common use are principally of two kinds, mastic and metallic.

Mastic cements, or what is termed anodyne cement, is for the purpose of curing tooth ache. This accomplished, and the tenderness having subsided, the tooth is stopped with gold or other metal, according to the choice of the operator or the circumstances of the patient. The temporary celebrity occasionally obtained by advertisers of cements only attests the extreme disposition to gullibility of the public. If relief from tooth ache is required, it may be obtained in the greater number of cases without the use of cement at all. At all events it is not the cement itself that affords relief. That is merely a vehicle to retain something else which is to act upon the diseased part, except indeed we allow it some share of utility in keeping the air from the cavity. This effect however is, from the nature of the composition, very uncertain. Where cement is used by an intelligent man, it is for the purpose of retaining the odontalgic remedy in apposition to the part affected. Thus when a patient applies with a tender tooth, and it is at once evident that

there is chronic inflammation in the membrane, and that the part which is exposed by the carious aperture is in a state similar to an irritable ulcer situated elsewhere, relief will be afforded by the application of an extremely small portion of the argentum nitration to the ulcerated surface, to be retained there by the introduction of a portion of mastic, previously rendered soft by warm water. Again, when there is general tenderness in the whole of the bony part of the tooth, so that the patient can scarcely bear the touch of an instrument, as much of the caries must be taken away as can be removed without inflicting intolerable pain and then a small portion of the acetate of morphine be introduced and retained by mastic. The pain will be soon relieved. Even in the worst cases of this kind a few repetitions of the application will generally ensure success. The tooth may then be stopped, and thus saved. But it requires the discretion and experienced eye of the dentist to decide which remedy should be applied: for should one be used when the other is required, an increase of pain and disease will be the certain consequence.

No one remedy can be relied on as infallible

in cases of tooth ache. To the two mentioned above might be added many others, each of which occasionally succeeds, and each of which, on the other hand, frequently fails. The morphine, however, is on the whole the most successful remedy that has yet been applied for this distressing malady.

Metallic cements are principally of two kinds. Those composed of a combination of metals capable of fusion at a low heat—that of boiling water, or those composed of granulated metal, either mixed up with an amalgum of mercury or compounded with a gypsum. The latter are almost too worthless to be mentioned. They are notwithstanding productive sources of revenue to many advertising professors, who shamelessly impose upon the confidence of their patients.—The former kind are occasionally useful as palliatives. Not that I would be understood as their advocate. I should recommend that every inveterately diseased tooth should be removed at once, with a view to preserve the healthy state of the mouth generally; because every such tooth is an exciting cause of inflammation, which inflammation extending to the surrounding parts, the

adjacent teeth, as has been already described, eventually fall into decay. But as patients will not at all times consent to the removal of a tooth, but make up their minds to put off the evil day as long as possible, it will be found that the use of the fusible metals, for stopping, will postpone that evil day to a much later period than could be hoped for if the tooth was allowed to take its course. Before using them, however, the patient ought to be apprised that there is no hope of effecting a cure by such means, and that the remedy is only temporary.

Although fusible metal, from the circumstance of its requiring heat to apply it, is certain to inflict farther injury on the bony parieties of the cavities, still it will frequently preserve a tooth for some years. For applying the fusible metal to a carious aperture, but few directions are necessary. In the lower teeth there is no difficulty. In the upper some little tact is requisite, as of course the metal, when in a fluid state, will not ascend against its own gravity; but with a light hand and a little management in placing the patient's head in a favourable position, the operation will generally be accomplished with ease.

The whole of the caries should be carefully scooped out of the tooth with a proper instrument. The hole, which is often very large, must then be made perfectly free from moisture. Two or three little round shots of the metal must be introduced according to the size of the cavity, and an instrument with a round bulbous head must be made hot in the flame of the lamp attached to the chair, which lamp should be brought round as near the mouth of the patient as may be convenient. When the instrument is properly heated and applied to the metal, the latter will become soft in a moment. The degree of heat should be merely sufficient to convert the metal to a soft paste. It should then be moulded and worked into the cavity so as completely to exclude the air and the fluid of the mouth. Other instruments besides those with bulbous heads are sometimes requisite. The operator should possess flat ones with rounded spear points, curved in different directions and of different sizes.

The fashion of using cements will, like others, pass away, and the great number of unsuccessful cases will accelerate its progress

to oblivion. It is to be hoped, that in time, patients will be able to discover that educated men are successful in a far greater number of instances than even the most fortunate of advertising empirics. But it is an old complaint and, unhappily, though old, not an obsolete one, that ignorant pretension, especially when wrapt in mystery, is more attractive to the million than modest ability. It is consoling, however, to the respectable practitioner, to know, that while empirical trickery may confer an evanescent fame, sound scientific acquirement is the only basis on which can be founded a reputation solid, progressive, and enduring.

In describing the instruments necessary for the operation of stopping, I fear I shall be found to differ from many dentists, as well with respect to the shape as the number of the instruments required. The little variety offered by the instrument makers is absolutely a satire upon the profession. Not more than one case in fifty—perhaps not more than one in a hundred, can be properly treated with such imperfect assistance. In the plate, the diagrams must be considered as merely intended to give an idea of the class of instruments suitable, from which

may be framed numerous varieties to meet every description of case. Mr. Weiss has all my patterns; and from him the dentist may obtain every variety that he can desire.

He should possess, *first*, a perfect set of instruments, of every shape and curve, for the proper removal of the caries, however awkward the situation of the aperture; *next*, instruments of every variety of curve at the neck or shoulder, and in the diameter at that part which is to be brought in opposition with the gold when it is pressed into the tooth; and *lastly*, an assortment of burnishers, of different shapes, to finish the operation, by polishing the surface of the gold plug, and detaching any ragged portions.

The first care of the operator should be directed to rendering the situation of the aperture as convenient as possible for the performance of the operation, and also to giving the carious hole, while divesting it of the decayed part, that peculiar shape which will be most favourable for retaining the plug of gold about to be introduced. By the first remark I mean, that where a carious aperture is situated unfavourably, for instance, between two teeth extending very

closely, it will be requisite to assist the operation by removing with a file any mechanical obstruction, in order to open a way to the diseased part. Much experience, however, is necessary, as a guide in this operation, as well as much tact in performing it, or there will be too great a sacrifice of the sound part of the tooth. It would be impossible to lay down any rules upon this subject ; every thing must depend on the experience and talent of the operator. It will be more easy to furnish principles for his guidance with regard to the other point—that of making the shape of the carious aperture suitable for retaining the gold plug ; and it is the more necessary, because it has been neglected by previous authors. The cavity should, if possible, be made perfectly cylindrical. A well shape, of the same circumference at the bottom as at the rim, is the best possible conformation that can be given for the purpose of retaining the stopping. It is, however, sometimes impossible, from the extent of the cavity, to give it this shape. When this is the case, the nearer it approaches to an oval figure the better, the bottom and the rim being very carefully preserved to the same size. It has been

recommended by some, to make the lower part larger than the rim, with the view of preventing the stopping falling out. Judging from my own experience, I should say, decidedly, that this method is highly objectionable in every way, it being unfavourable to perfectly fitting the cavity, and consequently to the retention of the stopping. If it be ever admissble, it is when fusible metal is used, which admits of more management in some particulars than gold; but, as has been already observed, where a tooth cannot be stopped without using the fusible metal, it is much better to remove it at once. The operation of stopping, when there is no mechanical obstruction to be removed, is simply this. The aperture should be first divested of every particle of caries; this must be done most perfectly; for should any portion, however small, be left, the operation will not succeed. For this purpose various instruments are requisite. If the aperture is small, having an irrègular shape, the enamel should be first cut with the file-headed instrument [Fig. 2,] to a sufficient size; next, a broach-shaped instrument, [Fig. 3,] the size of the aperture, should be introduced, having a curve, if the situation

of the caries requires it. This should be rotated in circles of the wrist, until the caries part is removed entirely, and sound bone observable at the bottom of the cavity. This instrument will leave a cavity shaped precisely as is most desirable. A powerful magnifying mirror should then be used, to show whether the aperture has been completely cleansed from caries. This being satisfactorily ascertained, the hole should be perfectly dried out with fine lint, a point to be most especially attended to, as the smallest quantity of damp remaining would be likely to prevent the success of the operation. A portion of gold should then be taken, more than sufficient to fill the cavity; for should it be too small, it will be useless, as no second portion can be introduced with success. It must consequently be removed, and that part of the operation, under such circumstances, commenced afresh with a larger piece of gold.

The gold should be introduced with one of the stopping instruments in the plate, [Fig. 4 and 5] the instrument having a curve suited exactly to the situation of the aperture, and being somewhat less in circumference than the hole itself. The gold should not be pressed too hard until

the hole is partly filled; but care must be taken that it thoroughly fills every part of the cavity, as the operation goes on. Having firmly pressed the gold in, sufficient should be left to form a little cone: a stopper should then be chosen, the exact size of the cavity with which farther pressure should be made, which if the instrument is well chosen and the gold properly inserted, will act upon every part of the plug. This being completed, all the extraneous gold should be removed, and the operation finished by polishing the surface with a suitable bur-nisher.

When disease is situated between the front teeth, the file should be first used, to cut away as much as possible of the caries behind the teeth and to expose the aperture in such a manner as shall enable the operator the better to get at it, that the tooth or teeth may be stopped from their posterior part. Dentists too often attempt to stop these teeth when thus diseased, either by pressing in a piece of gold between the teeth, making one portion serve for both teeth, or by stopping them laterally, neither of which methods will ever succeed. Where one piece of gold is used to stop two

teeth, it can never be retained, as the natural motion of the teeth will of itself soon displace it; and where the teeth are stopped laterally, it is impossible, or nearly so, that the cavity can be perfectly cleansed of the caries, or that a proper shape can be given to it, or that the gold can be either well introduced or pressed in with sufficient firmness to be retained. Where the size of the aperture prohibits the well shape, I have already said, that the oval should be preferred. The carious particles should be extracted by little instruments of a proper shape made in pairs [Fig.1.1.] right and left, as also pairs to cut from and towards the operator, ranging in size according to the dimension of the hole in the tooth. With these instruments the cavity must be rendered fit to receive the plug. They will also be found eminently useful in conjunction with the file, not only in the eradication of caries, but also as auxiliaries to the performance of the operation of stopping.

Having described the operation where mechanical assistance alone is requisite, it will now be proper to advert to those cases which require the assistance of surgery, if such a word

may be used in connexion with an operation apparently so trifling.

Where a carious tooth will not bear the pressure of an instrument introduced into the cavity, the first object must be to ascertain the extent to which the disease has advanced; whether the pain arises solely from the spongy decomposed bone of the tooth touching the lining membrane when pressed, or whether that membrane has itself become more or less diseased. It is not uncommon to find a tooth, on the introduction of an instrument, so tender as not to bear the slightest pressure without giving intense pain, and yet on the whole of the carious part being removed, no tenderness will remain, particularly if the cavity is washed well out with repeated locks of soft cotton saturated with spirit of camphor. Where this desirable result follows the removal of the caries, it is of course to be presumed that the lining membrane is not diseased. The tooth, therefore, should have the cavity carefully dried out and stopped in the manner already described.

Too generally, however, the disease is suffered to go on until the lining membrane has become affected. It is, perhaps, under

the influence of acute or chronic inflammation. If the former, the patient is most likely suffering severely from tooth-ache; if the latter, the tooth is painful when any thing gets into the carious cavity, or when it is subjected to food or air, which is above or below the natural temperature of the body. If the disease has been of long standing, that part of the membrane which lies contiguous to the diseased part of the tooth and is exposed, will probably be in a state of ulceration.

Where the membrane is suffering from acute inflammation, producing tooth-ache, and the patient is desirous of saving the tooth, the antiphlogistic regimen should be pursued. The application of leeches to the gums is most to be depended upon, assisted by purgatives and diaphoretics. If the patient is desirous of having the tooth removed, it is occasionally better to accede to his wish, although it by no means follows because a tooth is in this state that its removal is necessary. In very many instances, by a proper line of treatment, such teeth may be saved, and remain useful for years. After the attack of tooth-ache has subsided, and the membrane has recovered its former

healthy tone, the whole of the caries should be cleaned out of the cavity, if the tooth will allow of it, being careful to avoid, if possible, wounding the membrane, as that will probably induce a fresh attack of inflammation, and consequent pain. In fact this part of the operation requires the greatest nicety and care.

In some cases, after the removal of the caries, considerable inconvenience is experienced from tenderness and numbness, which though not actual pain, almost amounts to it. When this occurs, a small portion of morphine should be introduced into the cavity and retained there by mastic; and this should be repeated, at intervals of a few days, until the tooth will bear stopping. Where the membrane is wounded, the bleeding should be allowed to subside, and the actual cautery applied to the wounded surface. The method of doing it will be hereafter described.

When the disease has advanced until the membrane has become ulcerated, it becomes requisite to destroy sensibility by the actual cautery previous to clearing away the caries. The exact spot where the membrane is situated

should be ascertained, and should be cauterized in the manner about to be described.

The use of this remedy is of ancient date, but it is not until of late years that the method of employing it has been properly described. Even now it is frequently performed in an improper manner, which will account for the want of success which often attends it when attempted by ignorant men. As the operation is very generally performed, it would be more properly styled carbonizing the cavity of the tooth generally, than simply cauterizing the membrane. It should be kept in mind that the greatest care should be employed to avoid injuring the bony part of the tooth under any circumstance. The object to be attained is either to destroy the irritable ulcer in the membrane, by producing a new surface, or to destroy a portion of the membrane itself, which protrudes, either by granulations, which may be formed upon it, or from inflammation. The destruction of a portion of the membrane, if accomplished with a light, steady hand, and with the instrument at a proper heat, produces no subsequent inflammation, and very generally

the tooth may be stopped at once. Where any considerable tenderness remains, a day or two may be allowed to pass over. By using morphine as described, the inconvenience will generally be found to subside.

In describing the operation of cauterizing the membrane, I shall first consider the proper instrument for performing it. It should be formed of a long piece of steel, getting smaller to the end, and terminating in a bulbous head about the size of a small pea, inserted into a handle. That part which I would denominate the neck of the instrument, from the head half an inch down should be curved in such a manner as will be best adapted to the situation of the tooth to be operated upon. This curve should be given to it by the operator himself. In the centre of the bulbous head, and at its apex, should be a female screw tap, capable of receiving a small piece of platina wire, which should be larger or smaller according to the portion of the membrane to be destroyed. Several of these little pieces of platina wire, of different sizes, should be kept in readiness for use. The operator having dried out the cavity in the tooth, ascertained the exact spot where the

membrane is situated, and introduced a soft napkin to protect the mouth from the heat, should next bring round the lamp attached to the chair as close to the patient as is requisite, and having attached the platina wire to the bulbous head the latter should be held over the flame until made as hot as possible. When this is accomplished, the membrane must be lightly touched with the heated wire, and the required portion thus destroyed. Wire alone will not retain the heat sufficiently. Even in the short time which elapses in bringing it from the lamp to the mouth it will cool; but the bulbous head being once brought to a white heat, will keep the small wire hot for a considerable time; and, however great the heat, the wire will remain uninjured, which would not be the case with any other substance than platina.

A small black spot will be observed on withdrawing the cautery; this should be carefully preserved during the operation, which is to follow, viz. the clearing away the carious part, every portion and particle of which should now be removed; and then a little of the morphine should be used, if there is much tenderness, and the air kept out of the cavity by a small portion

of mastic. Generally the tooth should not be stopped on the same day on which the membrane is cauterized, unless, after the removal of the carious part no sensibility remains. It is usually better to wait a day or two until it is ascertained that the membrane is going on well, adopting such plans of treatment as circumstances may require to meet the symptoms that may arise. Should there be inflammation with pain in the tooth, a leech or two should be applied to the gum, and constant fomentations with warm milk and water to the mouth. If there be no inflammatory symptoms, but very considerable pain, and tenderness in the tooth, the morphine can generally be depended on for giving relief, taking care at all times to observe that the cauterization has been properly effected, and that a sufficient portion of the membrane has been destroyed. Should this not have been done in the most satisfactory manner, it will be better to repeat the operation at once. A little experience and judgment are requisite to direct the operator in choosing the proper time for stopping. No rule can be given except this—that when the tooth has been thoroughly cleared of all the carious particles, and the cavity will bear

the pressure of an instrument within it, it may then generally be stopped with safety, especially if the membrane has retired considerably inwards, so that the little black carbonized part is so distant as to be evidently out of the way of being pressed upon by the stopping. Under such circumstances there is little to fear for the success of the operation ; but should a pain be experienced, which occasionally happens even for some time afterwards, a leech applied at these times to the gum will generally subdue it, and eventually the tooth will become healthy and useful. Where, however, the tooth remains tender after the cauterizing, it is better to wait and give the membrane the same treatment which would be proper for any other part under similar circumstances.

The use of the actual cautery has been condemned by some, and in its place the *argentum nitratum* substituted. I really think that this dislike to the former operation must have originated merely from its having been performed in an unprofessional manner ; for it is superior in every respect not only to the common caustic, but to all others. Dentists occa-

sionally recommend camphor, spirits of wine, and other applications to be applied, on lint, to a tender tooth, giving the patients to understand that such treatment will eventually destroy sensibility. To the use of all such applications I would give a decided negative; morphine alone will occasionally be useful in slight cases. In all others it will be better either at once to extract the tooth, if it admits not of any other remedy; or, on the other hand, if it do, to apply the proper remedy in a decided and scientific manner.

SCALING

THE

TEETH.

THE operation termed scaling is performed for the purpose of removing from the teeth a substance very improperly denominated tartar. This substance is deposited by the saliva, and consequently the greatest accumulation takes place upon those teeth and those parts of them which are situated nearest to the mouths of the salivary ducts, viz. the back part of the front teeth in the lower jaw where the canals from the gland empties itself, and also the outer surface of the molares of the upper jaw. Nothing is more destructive to the health of the teeth and gums than this concretion. Where any considerable quantity of tartar is suffered to collect,

the gums become swollen, and are kept in an inflammatory state, producing absorption of the alveolus, and consequently the premature expulsion of the teeth from the jaws.

There are few persons whose teeth have not this substance more or less deposited upon them, and in some the accretion becomes two or three times the size of the teeth. I have had cases where six or eight front teeth have been completely embedded in this substance, and from the absorption of the sockets the whole has come away in one solid mass. Cases are related where the action of the jaws has been literally impeded by the thickness of this deposit. This substance has by some been thought to preserve the teeth; an opinion deserving notice only for its absurdity. Moss and weeds may as reasonably be supposed to nourish the trees upon which they are found to grow. It has been asserted also that when the teeth are covered deeply and the sockets have become absorbed, the gums having also retired, that the tartar supports the teeth, and consequently should not be removed. This would be correct if the injury done by allowing the tartar to remain extended only to the teeth

encrusted by it ; but unfortunately this is not the case, wherever there is much tartar about the teeth the gums become red, turged, flaccid and given to bleed upon the slightest touch. Matter will be found to pass out at the neck of the teeth, the breath becomes hot and offensive, the general health will often be affected, the stomach, sympathizing with the mouth and often ulceration of the gums ensues. If the tartar is allowed to remain, not only the teeth encrusted with it come out, but the neighbouring teeth are rendered carious from the inflammation being conveyed to the lining membrane of one or other of them. In fine, no mouth can be healthy where the teeth are covered with tartar, and where the deposit is very large, the health of the body generally is often more or less affected.

The operation of scaling is one of great antiquity, being noticed by the earliest authors ; but there is a misapprehension as to its nature, which prevails almost universally out of the profession. When a patient applies to have his teeth scaled, he generally expects that the dentist will not only remove the tartar, but that he will clean the teeth, and make them

as white as possible; this latter operation, although a proper, as well as a very simple one, is, in the hands of the ignorant empiric, replete with danger. Patients are gratified to see their teeth rendered white, but their pleasure is often followed by regret at the permanent injury which they are found to have sustained.

I shall first describe the operation of removing the tartar, and next the simplest method of cleaning the teeth without injuring them.

The instruments sold in the shops as scaling instruments, are without doubt the most awkward things for the purpose that can be conceived. Nothing can be worse calculated for effecting the proposed object with either ease or elegance. The principle points to be regarded, to produce as little inconvenience to the patient as possible in performing the operation of scaling, are to remove the tartar lightly, although perfectly without jarring or using force, and without injury to either the gums or teeth. To attain these objects, the operator must possess suitable instruments, a light hand, a good eye, and a certain mechanical tact in the use of the instruments that can

be acquired only by practice. Several instruments are requisite for removing the tartar, and particularly the six which I am about to describe. For the anterior part of the incisores an instrument is sold in the shops, of a diamond shape, or spear pointed. The one which I use and would recommend, is of a somewhat different shape, being about a quarter the breadth, and slightly turned up at the point, and the back of the instrument rising to an edge, instead of being flat. The instrument should be of the best steel, and capable of taking a good edge; not that of a knife, but that of a scraper, so that when used as one, the edge will not be turned. With this instrument the tartar on the anterior surfaces of the teeth should be removed, by placing its cutting edge between the edge of the gum and the under surface of the tartar, with the thumb or fingers of the left hand, (according to the tooth operated upon) on the cutting edge, that the tooth may not be jarred. In some cases the tartar will fly off in scales with the slightest pressure; but occasionally it adheres so strongly that there is considerable difficulty in detaching it. This has led to the use of solvents to assist

the instrument ; and for this purpose powerful acids are proposed. The danger of such a practice is evident. Acids will of course have the same action on the enamel of the teeth that they have on the tartar, and consequently the former substance will sustain injury. I shall have occasion to speak further upon the subject of applying acids to the teeth in another place ; but it is necessary here to state that however tightly the tartar may adhere, there is no occasion for the use of these agents to destroy it. With a little care and tact in the operator, it may be removed with ease and safety. From the posterior part of the front teeth, where the tartar at all times gathers most thickly, a pair of instruments are requisite, one for the right hand and another for the left, instead of the awkward triangular one sold for that purpose, It is difficult to describe the exact bend that these instruments should have, as also their shape. The blade part should be similar to the one before described to the anterior surface of the teeth, but considerably smaller and more turned up at the point. (*See the Plate fig. 3.3.*) The right hand instrument cleans the left side of

the teeth, and *vice versa*. After having removed the tartar from the anterior and posterior surfaces, a thin flat instrument should be passed in between the teeth to remove the tartar between their interstices. Two or three of this kind should be procured, varying a little in shape, breadth, &c. for cases where the teeth are irregular or otherwise awkwardly situated. The insides of the molar teeth require also a pair of instruments, right and left, of a different shape from those used for the front teeth, being much broader, cutting on one side only, and the shaft of each instrument bent in such a direction as to render it most convenient for the part it has to perform. (*See Plate fig. 2. 2.*) These six instruments are essential; others, however, are occasionally required. I trust I am one of the last persons in the world to seek to elevate the profession in the eyes of the multitude by surrounding it with mystery, or to claim a superiority over my professional brethren, founded on the possession of a great variety of instruments; yet I am compelled to say that although those which I have named would *in general* answer the purpose of removing the

tartar if the dentist were possessed of no other varieties for this purpose, he would be but indifferently supplied. The convenience of having instruments for the right and left hand side of the mouth will, I think, be obvious. It is, I believe, a new method. I have never seen it in use, nor heard of its being employed, either for removing tartar or for extracting teeth. Although I lay a claim to the invention of these right and left hand instruments, I do so as all men in the present age of mechanical improvement ought to do ; with the admission that although I may never have either seen or heard of such instruments, yet that amongst the many scientific men which it may be presumed our profession contains, it is not improbable they may have been already introduced. After having removed all the tartar which can be got off by the instruments, it will often be found that the patient complains of the back part of the teeth being rough to the tongue, and the portion of tartar left will form a nucleus for further deposits. If the teeth are left in this state, they will require but a short space of time ere they will be again encrusted

as plentifully as ever, to say nothing of the inconvenience which the patient will experience for some days after so imperfect an operation. Recourse must now be had to the magnifying mirror, before described. All the tartar thus rendered visible being removed, if the patient still complains of roughness, an instrument shaped as a scraper and suitably curved for getting at each part of the tooth, should be used ; after which, should any roughness still remain, the teeth must be carefully rubbed with a piece of fine wood, of a suitable shape, dipped in finely levigated pumice, or rotten stone, and afterwards well brushed with a pointed brush inserted at right angles into the handle.

During the operation the patient should repeatedly rinse the mouth with luke warm water, impregnated with Eau de Cologne, or any other aromatic spirit. In some instances the teeth will be so loaded with tartar that it is unsafe to remove it all at one time. Where this is the case, that part which is nearest the gums should be first removed, so that they may be thoroughly relieved. This being accom-

plished, the patient should be desired to use some proper application to the gums for a week, which will tend to their eventual restoration. Lotions, as under, may be used :—

R. Aluminis \mathfrak{z} iss.

Tinct. ratane

—— kino $\overline{\text{a}} \text{a}$ \mathfrak{z} iss.

Mist. camphoræ \mathfrak{z} iss.

Misce.

R. Decoct. quercus \mathfrak{z} iv.

Vinum rubri \mathfrak{z} ij.

Misce.

Where the gums are not much inflamed and are spongy, the vessels should be relieved by free incisions with the lancet, or leeches may be applied, and lotions as under may be used :—

R. Decoct. hordei. comp. \mathfrak{z} viiij.

Potassæ nit. \mathfrak{z} ij.

Misce.

Nothing tends more to create a healthy

action in the parts than relieving the over-charged vessels. If the inflammation should not be subdued in a few days, the lancing should be repeated. When they are somewhat relieved, and the teeth show signs of fastening, the remaining tartar should be removed, either at one or more sittings, until the teeth are perfectly freed from it and no roughness is felt to the patient's tongue. After the tartar is removed, the teeth are often of a dark lead colour, and this cannot be remedied by instruments. The general way of improving the appearance of the teeth is by applying some one of the mineral acids with a camel hair brush; and amongst many dentists this, which is termed making the teeth white, is the invariable termination of the operation of scaling. Many patients, ignorant of the mischief which such a practice is capable of producing, will be highly dissatisfied, and question the professional ability of the practitioner who neglects it. It is no uncommon thing to hear patients speak with displeasure of a dentist, by saying that he was not capable of making their teeth half so white as some other dentists; and tooth-

powders, as I shall have occasion to mention, are too often considered good or bad, in proportion as they make the teeth white or fail of doing so. With this persuasion patients place themselves under the care of empirical professors, who, without hesitation, have recourse to the various acids which whiten the teeth. Thousands have had cause to regret their having seen a dentist from this cause. By the improper use of acids, that beautiful polish natural to the enamel is injured; and where the application is repeated, layer after layer is removed, until the enamel is totally destroyed or honey-combed. Pits and spots of brown appear, and the teeth become morbidly sensible to changes of temperature, pain being produced from cold air or water. This state cannot long exist without inflammation attacking some of the teeth, and premature decay is the consequence. Notwithstanding the fatal results of the injudicious use of acids, yet there are dentists who contend that if the patients insist upon the teeth being made white, the operator ought to comply; in fact, that the professional man must please his pa-

tient at all risks. Such a doctrine will need no remark from me, since it will meet with an indignant refutation in the mind of every honourable and conscientious practitioner, while with the unprincipled empiric it would be vain to argue. It must be left, therefore, to the moral feelings of every individual to determine how far the paltry acquisition of a fee will justify the infliction of a permanent injury under the disguise of professional service. I have occasionally found persons so self-willed that they would insist upon having their teeth made white, because some dentist had before made them so. But these are rare instances; the patient may generally be set right as to the danger of the practice, and will then be satisfied with as much being done to promote the beauty of the teeth as is consistent with their health and safety. Considerable improvement may be effected without any improper use of acids; but it must be laid down as a general rule that no teeth ought to be made whiter than their natural colour; any attempt to surpass this will be dangerous. All extraneous particles, all stains, spots, &c. having been

carefully removed, the surface of the teeth should be polished ; this may be done without the slightest danger. It will be found that in proportion to the height of their polish the aptitude to become discoloured is diminished. The method of polishing I shall describe. After all extraneous particles are removed as far as they can be with instruments, the teeth will not unfrequently present a filthy appearance by being covered with a dark brown black, or green fur. This must be removed with a small piece of soft tough wood, cut to a convenient shape, dipped into extremely finely levigated pumice stone, with which the discoloured part should be rubbed until the stain disappears ; after which the teeth, on the part before acted upon, should be polished with some testaceous powder. This method requires a little time ; but the reward is equal to the labour, as instead of leaving a surface, which although white is rough, and consequently prepared for the adhesion of the first colouring matter contained in the food, a surface highly polished is obtained, the teeth are left just as white as nature ever intended they

should be, and rendered less susceptible of again becoming discoloured.

This method will in general succeed ; but there are some stains so apparently eaten into the enamel, that it becomes requisite before they can be removed that a layer of enamel, although the smallest quantity possible, should be taken off. In this case it may as well be removed chemically as mechanically, and a little acid used with discretion will be the best agent. The discoloured tooth or teeth should be wiped perfectly dry and a small quantity of acid applied to the stained part only, which should be allowed to remain only just long enough to act upon the surface. It should then be taken off and the part polished in the manner before mentioned.

Where there are black indented spots or grooves in the enamel, all that can be done is to clean them out with a fine pointed piece of wood and pumice stone, and where they are not deep and are favourably situated, a properly shaped file may be used. After the teeth are made perfectly free from tartar and other extraneous matter, suitable brushes, powders, and tinctures should be used that they may be kept so.

TOOTH BRUSHES.

The various opinions which are held relative to the shape and texture of brushes, would lead us to suppose that the matter was a much more important one than it really is. There are even patent tooth-brushes. A late author insists upon the necessity of hard brushes, and states that he has tried for some years to do himself all the injury he possibly could by using a hard brush, and finds that he can inflict none. I confess I am not yet acquainted with any necessity for using a hard brush, presuming upon its doing no injury: the teeth do not require it. A brush too hard is as useless from having no elasticity as a very soft one from its having no firmness. There is a medium between the two which should be chosen. A brush for the anterior part of the teeth should have its bristles cut lower in the centre than each end, so that when looked at sideways, the bristles should form the segment of a large circle, the external row inclining outwards a little. In texture it

should be as elastic as is consistent with a proper degree of firmness, where the gums are not diseased and the teeth not loose ; but when these defects exist, a softer brush should be used. Under any circumstances, however, the hairs should not be so soft as to lose their elasticity by use. The brush should be used as much as possible in a perpendicular direction, not as it regards the brush but the teeth. Brushing the gums until they bleed is recommended by a late author. I see no necessity for this rude method of phlebothomizing ; notwithstanding I believe that the moderate use of the brush upon the gums is highly beneficial.

As the grinding surfaces of the molar teeth are apt to retain matter in their indentations which might be injurious, a brush rather larger than that above mentioned should be used for the purpose of cleaning them ; the bristles should be much stronger, although by no means so strong as some which are sold for this purpose, as it is totally impossible that they can act but upon the projecting points of the teeth. The object is to have the bristles of a sufficient length, strength, and elasticity, that their points may insinuate themselves in the

little indentations of the grinding surface. A hard brush with short bristles such as are sold for this purpose, is consequently altogether unsuitable, The back part of the teeth are best kept clean with a small square brush with bristles rather long and elastic, and left highest in the centre, the corners of the square being cut off. The handle of the brush should be bent a little below where the bristles terminate. A flat brush also with one row of bristles, or a pointed one, the bristles being inserted like a camel hair pencil, is useful for inserting between the teeth, to remove as soon as deposited the tartar which, without care, is very apt to accumulate in that situation. With these brushes, if well chosen as to their shape and texture, the teeth may be kept clean in every part.

TOOTH POWDERS.

In no part of our profession has the mind been more exercised than in finding out a tooth powder which should in itself be a panacea. From the earliest era of our science, we have handed down to us a variety,

over

of recipes both in prose and verse. Galen's recipes are in verse, as are many others of early date. From the ingredients employed in the tooth powders of the ancients we might conclude that one vied with the other in the introduction of the greatest number of articles, and those of the strangest description, some of them too indelicate to be repeated. Thus much, however, may be said of them, that the generality of these compositions are by no means so injurious to the teeth as the greater number of those sold and used in the present day, many of which deserve public censure in a similar manner to what took place in Paris in 1793. Almost all that are prepared for the shops are injurious. A tooth powder to be popular must make the teeth white. I need not repeat that this is usually accomplished by acids. Many dentists make a great secret of their own compositions, and attach a great deal of importance to them. No man of science can be deceived by such *charlatanerie*. But certainly if these compositions were capable of performing all that is pretended, they would be worth the notice even of the learned.

A tooth powder is really however, of little

value except as a mechanical aid to the brush.

The aromatic drugs which enter into these compositions can be of no use to the teeth, though they may certainly be more or less useful to the gums; but for this purpose a much better mode of application may be substituted. Those who are acquainted with the structure of the teeth are well aware that myrrh bark, and other drugs, which enter into the composition of tooth powders, can neither whiten the teeth nor preserve them. Bearing in mind that the use of a tooth powder is to assist the action of the brush, in taking off any extraneous body which may adhere to the teeth, and for which purpose the brush alone is frequently found insufficient, those substances should be chosen which can be levigated finely, and which will not have a tendency to wear away the enamel. The testaceous powders, therefore, in combination with some alkaline should be preferred. Charcoal is highly spoken of. There are, however two strong objections to it. First, it cuts through hard substances rapidly, consequently will destroy the enamel; and secondly, it is a very dirty application to the mouth, and others much less so may be readily

found. Where, however, it is used, that which is made from the areca nut, or from the vine shrub is to be preferred. This, mixed with creta, may be used without injury, where there is a *penchant* for this substance. The best tooth powders, however, in my opinion, are composed of such ingredients as the following formula :—

R. Pulv. cretæ. prep. ʒiii.

Saponis hispanici ʒi.

Pulv. rad. iris. flor. ʒii.

Sodæ carbon. ʒi.

Misce.

I have generally found after the teeth have been perfectly cleaned with instruments, that if constantly brushed once or twice a day with this powder, they are kept free from tartar. The previous removal of tartar must, however, have been complete. It must not have been performed in the slovenly manner common with some dentists, which renders a repetition of the operation necessary in six month's time.

Where the above formula is insufficient to keep the teeth clean and of a good colour, a more active powder may be added, such as the bole aromoniæ. Such may be said to be the

really useful ingredients of which tooth powders are to be composed; others may be added so to please the fancy either of the dentist or his patient.

Tinctures and other fluid applications are often extremely useful to the gums, when they are in an unhealthy state. As a simple application to the mouth for general use I know of no better thing than the *linimentum saponis*. Where the teeth are not much disposed to collect tartar or become discoloured, they may be kept in good order by this application alone, without the use of any powder. The camphor contained in it is particularly useful to the gums. Where there is a dull uneasy pain in the gums without much inflammation, the *linimentum saponis cum opio* may be substituted with success. I have found almost miraculous relief given to the mouth by this simple application. In those cases where pain remains after inflammation has been subdued, it is equally beneficial: Tinctures, like tooth powders, have been made the vehicles of quackery from time immemorial; and, like tooth powders also, those which have been most popular have too generally been the most pernicious.

Such tinctures contain acids for whitening the teeth, for which they are extravagantly extolled: but in truth tinctures ought to have no effect at all upon the teeth; their action should be confined to the gums. The teeth, from their structure, are not likely to be affected by fluids, except they exert a chemical action upon their surface, the danger of which has been already pointed out. Tooth pastes contain similar ingredients to those used in powders, worked up in another form, and of course act in a similar manner. The preference of one to the other must depend upon the fancy of the patient.

LIGATURES, &c.

FOR

FASTENING LOOSE TEETH.

Where from the absorption of the alveolus the teeth have become loose, it becomes requisite to afford them artificial support. The loose teeth will otherwise aggravate the disease by increasing materially the irritation and consequent inflammation, and thereby tend to expedite their loss.

In the early stages of the disease ligatures should be as much as possible avoided. Indeed any artificial means of supporting the teeth at this period generally produces mischief to the adjoining ones. The object sought is much better effected by surgical treatment. By resorting to proper methods sufficiently early,

the teeth and their involucres may be very generally restored to health.

In certain states of the constitution however, these means may be insufficient to check the progress of the disease, particularly where the system is under the influence of mercury. In these cases the local disease is seldom affected by local remedies. Internal remedies alone will be efficacious. Under such circumstances it will be better to remove those teeth, of which the alveolus is so much absorbed that the experience of the practitioner leads him to conclude that they will never become fast. By so doing the rest may frequently be preserved. A principal object is to prevent the disease from extending, which, if unchecked, it will do, through the whole mouth. When teeth are allowed to remain after the disease has arrived at a certain stage—even though retained by artificial means—the absorption of the sockets will go on imperceptibly as long as any irritating cause keeps up the inflammation in the surrounding parts, and the teeth will be thrown off, one after another, as over ripe fruit drops from the tree. Nothing but freeing the mouth from inflammation and bringing about a healthy

action in the parts, will stop the absorption of the alveolus. Ligatures and other artificial supports, are in my opinion only admissible when the patient will not agree to the adoption of the proper means for effecting a cure. All that can be accomplished by them is to retard the progress of the disease. When the teeth are so loose that the tongue will move them about, they are like peas in an issue, and the looser they become the more inflammation is kept up. It is in this case, under the supposition that the patient will not have them removed, that artificial support is useful. There are professors who assure us that their power over their patients is absolute—that their will is law—that they have only to direct the line of treatment, and whatever sacrifice may be required, the patients instantly and willingly submit. I own myself not yet to have arrived at the possession of this fascinating power, and sorry am I to be obliged to say, that such is the conceit or wilfulness of some patients that, either from attachment to a blind opinion of their own, or from timidity, or some other of the hundred and one reasons which from time to time are offered against the judgment of the

practitioner, it is often impossible to get them to consent to the removal of certain teeth, the retention of which renders a cure impracticable. Such instances have frequently occurred to me ; I have been compelled either at once to give up the patients, or to adopt a palliative course of treatment, with no hope but that of postponing the evil day a little longer.

Of all the methods of supporting loose teeth, the use of ligatures is the most objectionable. There is at all times an uncertainty in applying them so as to avoid irritating the gums : the pressure cannot be so moderated as to ensure a certainty that it shall be applied in no greater degree than is actually requisite and in that direction which will be least injurious. Ligatures are also extremely uncleanly, collecting a great deal of mucous which emits an offensive odour and adds much to the unhealthy state of the surrounding parts. If ligatures are used, the silk-worm gut is the least objectionable in point of cleanliness. Fine gold wire would be preferable to every other material, but its application is uncertain.

As all dentists are presumed to be good mechanics, it will not be difficult for them to

construct a gold apparatus for the purpose. A model should be taken of the part of the mouth requiring support. A plate of fine gold should be stuck to the back part of all the loose teeth and extend beyond, to one or two of the healthy ones, over which a gold cap should be prepared. The plate must be most accurately fitted, and made so that its lower edge will not touch the gums at any part. A fine elastic gold band must be nicely fitted along the anterior surface of the teeth, and attached at each end to each of the gold caps. If this apparatus is carefully made, and well adapted to each particular tooth, it will probably be the best that can be applied.

In giving my method of retaining loose teeth, I would beg that the reader will keep in mind that I recommend artificial support only when the patient refuses to have the disease eradicated by surgical means. However complete the means of support, the whole of the loose teeth thus sustained will eventually come out.

FINIS.

